APR 1996

Britain's favourite Personal Computer magazine

WIN 3 CD-WRITERS P279

Personal Computer World

Personal Computer World

April 1996 £2.95

Overseas Price £3.95
Germany DM 20,00 Italy 18,000 Lire
Spain 1,225 PTS Malta Lm 2.85c
Holland HFL 17,95 Belgium 364.00 BFr
Finland FIM 49.50 Canada CAN$12.95

VNU Business Publications

Pentium Overdrives p56

Palmtop computers ● DTP packages ● Drawing software ● Paradox 7 ● Sound cards ● 3D accelerators ● Pentium Overdrive chips ● Battle of the Online Services

Power to your palm

PDAs on test

SOFTWARE

DTP
Drawing
Paradox 7

HARDWARE

Sound cards
3D Graphics cards

IF YOUR CD-ROM AND 3.5" DISK ARE MISSING ASK YOUR NEWSAGENT

Battle of the Online Services

ALL HARDWARE TESTED BY THE VNU LABS

VOL19 NO4

TRIPLE DISK MEGA PACK

16 Demos, Win 95 Utilities, Cache checker, Lottery cracker

04

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Small computers that are useful and stylish are becoming indispensable. Six of the best are put to the test by *Simon Rockman*.

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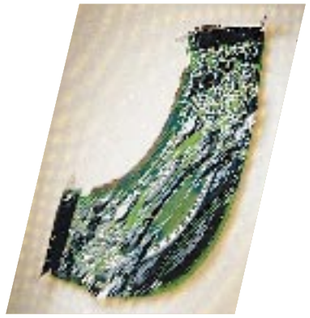

● Friends, readers, lend us your ears. *Eleanor Turton-Hill* tunes in.

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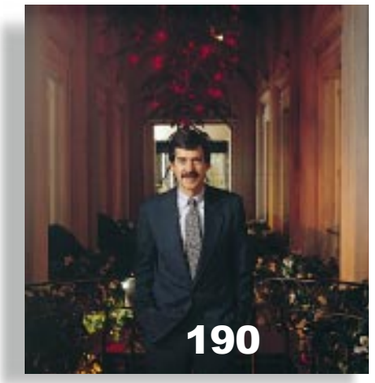
● A line here, a squiggle there. *Ken McMahon* is quick on the draw.

Features

Computing for the blind

For blind and partially sighted people, GUIs, especially Windows, have made things worse. *Adele Dyer* explains why.



Bud Colligan

Ben Tisdall talks to the CEO of Macromedia, the company battling to dominate the multimedia tools market.

Focus: Battle of the online services

With the launch of AOL in the UK, a battle for control looks certain between old hand CompuServe and new kids like Microsoft Network and UK Online. *Wendy M Grossman* surveys the scene.

Inside Microsoft

Ex-*PCW* contributor and Microsoft employee *David Gristwood*, on how the world's most successful software company stays ahead.

Reviews

Regulars

Direct Buyers' World

Personal Computer World

Cutting Edge

CD-ROMs: Ferrari arrives in style

Hands On

PCW Cover Disk

Software for disk demons

Your guide to this month's software on floppy disk.

MORE THAN 2.5Mb jam packed full of exciting and darn useful software. For Internet addicts there's *PCW's* Exclusive Secret Agent; and for games fans there's Lunacy and Alternate Solitaire. There's a powerful, handy, Sys-Win utility, too.

Secret Agent

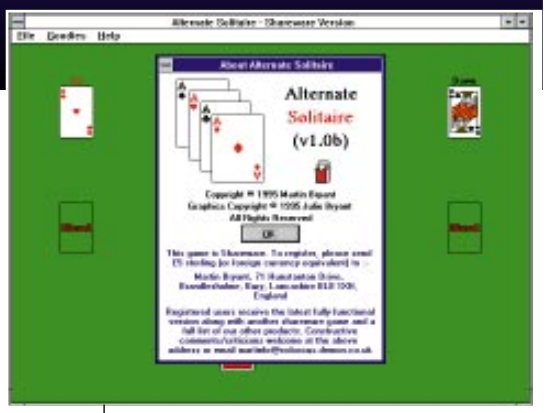
Software that slashes phone bills by turning Netscape into an off-line reader. Quickly Surf around your favourite sites, then log off and pop into Secret Agent which will recall all the pages you've just surfed, including the hotlinks. We recommend you set your Netscape cache to at least 10Mb to benefit from Secret Agent.

Lunacy

Thrill to the spacial puzzles offered by this brain-bashing extravaganza as you steer your way around an ever-changing and devilish grid of movable platforms.

Alternate Solitaire

An absorbing card game challenge.



Top *Discover the hidden benefits of Secret Agent and cut your phone bills*
Above *You're never alone... with a deck of cards*

Sys-Win

A complete and very powerful editor for system files that makes it a breeze to keep Windows in tip-top condition. But beware, this program is strictly for the technically competent. If you don't know your system files from your elbow, leave well alone.

David Price

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If you have problems with the cover disk, such as receiving a "Cannot read from drive A" error, please return it to the duplicator: TIB plc (PCW), TIB House, 11 Edward Street, Bradford BD4 7BH (who may be contacted on 01274 736990), together with a stamped addressed envelope and two 25p stamps. Where it is a duplication fault, the postage will be returned along with a replacement disk.

If your problem is not due to a faulty disk, and a phone number is shown for the publisher of the program in question, then it will probably be quicker for you to call them first as they will be able to provide direct assistance on their own programs faster than might otherwise be possible.

Alternatively, ring our cover disk hotline on weekdays, between 10.30am and 4.30pm, on 0891 715929. Calls are charged at 39p per minute cheap rate and 49p at all other times.

The *PCW* cover disk is virus checked at every stage of production. However, *PCW* will not accept liability for any problems arising from the use of the disk. Installing or running any of the programs on the disk indicates your agreement to this condition.

You are advised not to install any software on a networked PC before checking the disk. While *PCW* maintains a high standard of quality control, disks may be damaged in transportation. Check the disk's shutter before inserting it in the drive: slide it to the left and allow it to spring back.

PCW Interactive CD-ROM

We've packed this CD-ROM with our biggest collection of demos yet.

MAIN FEATURES

This month, we have a huge selection of games and utilities, including desktop publishing and graphics, Internet, business and more. Other highlights include a collection of DOS, Windows 3.1 and Windows 95 shareware, and a digital film trailer from Disney.

Curator

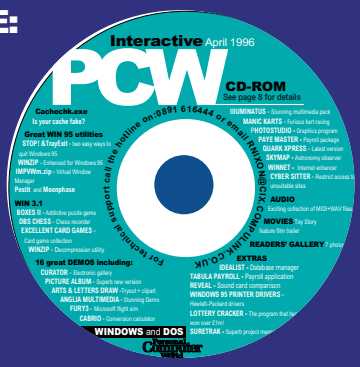
A program formed of three parts: an Archive, an Electronic Gallery and an Electronic Publishing facility. The Electronic Gallery part of Curator creates a virtual Gallery environment from within which to work. In the Exhibition Editor (including Portfolio Editor and Gallery Design Editor) it's possible to create spaces within which a viewer can orientate North, South and so on. Or view a wall, or a photograph of a landscape. It can do a whole lot more, too.

Cyber Sitter

Prevent pesky children from accessing undesirable sites on the Internet.

A P R I L 1 9 9 6

PCW INTERACTIVE:
Entire Contents List



AUDIO
Hands On MIDI

COVERDISK
This month's floppy software

DEMOS
Arts & Letters Draw
Cabrio
Curator
Cyber Sitter
Fast Forms
Fury 3
Idealist
Illuminatus 3
Logical Decisions
Lottery Cracker
Manic Karts
Paye Master
Photo Studio
Power Planner
Quark Xpress
Rescue
Screamer
Skymap
Sound Demo
Suretrak
Top Forms
Tycoon
Win Net
Wordly Wise

C O N T I N U E S O V E R

F O L D H E R E

PRINTER DRIVERS
Colorado, Deskjet600, Deskjet850c

GALLERY
Readers' Photos

MAGAZINE
DB Hands On
Magazine Files
PCW index — now including Excel files of the index
Windows 95 software — Impvwm, Moonphase, Postit, Trayexit

MOVIES
Toy Story trailer

DOS & WINDOWS 3.1
Boxes 2
COM Find
DBS Chess
Excellent Card Games
Font List
Label Pro
Smooth Editor
Tombstone
Win Dupe
Winzip 16

WINDOWS 95 SHAREWARE
Stop
Winzip 32

SYSTEM FILES
CD Test
SVGA 256 Colour Graphic Drivers
Video for Windows 1.1e

MACINTOSH
20Mb of games and utilities

● **Minimum requirements:** 4Mb free RAM (some can be in a permanent swapfile), 386SX/33 processor, Windows 3.1. Users with less than this should be able to run all the DOS programs on the CD-ROM directly from DOS or Windows (rather than using the front-end). For best performance we recommend: 8Mb installed RAM, 486 DX/50 processor, Windows 3.11 or Windows 95.

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CONTINUED FROM PAGE 9

Top *Phased out by mooning? One of four new software programs for Windows*
Middle *Your Fury friend, plus powerful presentations and a new item from Anglia*
Bottom *Pay back your neighbours by making them sit through a showing of your holiday snaps and videos*

Fury3

The Microsoft Fury3 Trial Version has the full functionality of the retail version of Fury3 with these exceptions: the Trial Version does not support the "Show Videos" option in the Game options dialogue box, so videos do not play. You can fly only one mission. You cannot save or resume games. Graphics in the Trial Version's online Help are 16-colour and are therefore not as high-quality as the Windows 95 Help graphics in the retail version of the game.

Blackwell Idealist 4.0

A preview edition of the version 4.0 upgrade of this award-winning database. It gives you a look at the latest 32-bit software, and you will need Windows 95 or Windows NT 3.51 to run it (when released, the full software will also run on Windows 3.1x). A 16-bit version is available, as well, with some differences in the features provided — call 01865 206 206 for a demo disk if you are using Windows 3.1x and would like to see a sample of the software.

Manic Karts

Manic Karts makes best use of whatever memory your machine has available, and uses up to 16Mb of RAM. If you are playing Manic Karts on a machine with less than 16Mb, then the number of kart animations will be reduced to fit in the space available. If you are running SMARTDRV, this uses memory that could be used by Manic Karts so it is a good idea to disable SMARTDRV by removing it from your AUTOEXEC.BAT file. Edit the file AUTOEXEC.BAT, and type the word "REM" at the beginning of the line which contains SMARTDRV. Remember to include a space after "REM". If you want to re-instate SMARTDRV, simply remove the word "REM" to leave the file AUTOEXEC.BAT in its original state.

Quark XPress

This useable demo needs at least Windows 3.1, 4Mb of available RAM, 6Mb hard disk space and a VGA display.

Toy Story

See a trailer of this innovative, computer-animated film.

Shareware

All the very best new shareware.

Macintosh

More than 20Mb of great Mac games and utilities.

Configuring Video for Windows

If you select the "New users start here" button on the first page of *PCW* Interactive you'll have the opportunity to install the latest version of the Video for Windows runtime, so that you can view the digital movies on the CD. If you haven't previously installed Video for Windows from a *PCW* Interactive CD, you should install this new version as it contains the latest drivers which deliver higher quality, a larger size and a faster playback rate. If you don't install the new version, some videos will show the message "Cannot display this video", or give similar warnings.

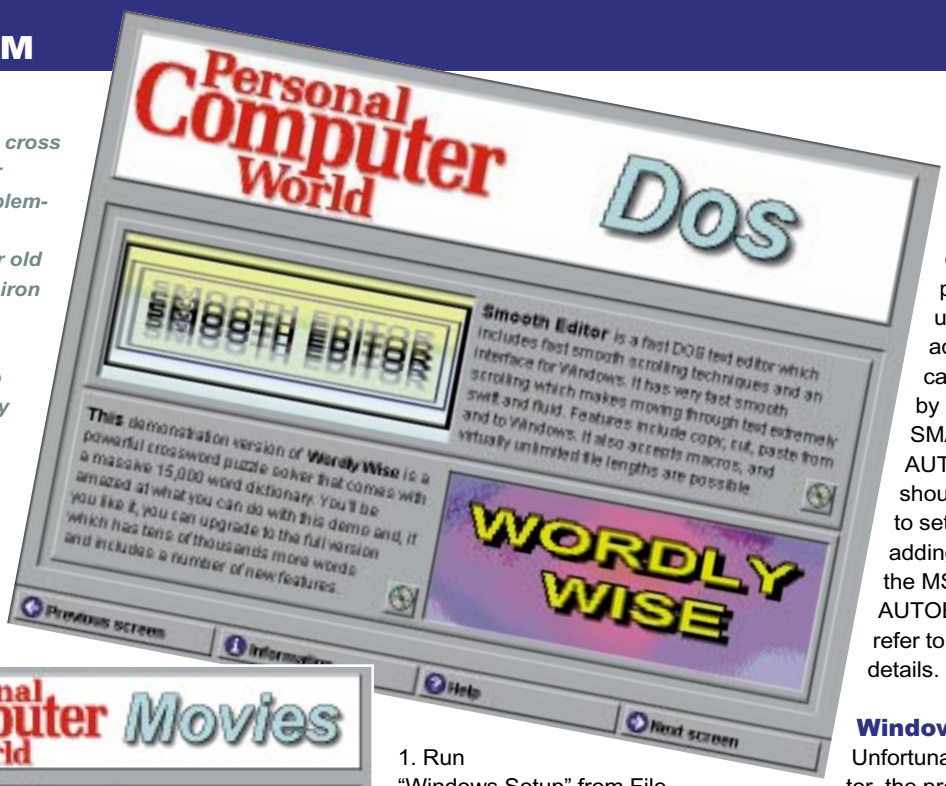
There are also some extra buttons on the Video for Windows page which allow you to fine tune your PC's performance without having to leave *PCW* Interactive or restart Windows. In particular you can choose to have digital movies played back on your PC at full screen resolution — that's right, without using hardware add-ons like MPEG cards, you can have full screen digital videos when you run the *PCW* Interactive CD-ROM.

But please remember when you exit from *PCW* Interactive, that if you leave the option for full screen video selected, then all video in other applications will be full screen, too. If you don't want this; re-run *PCW* interactive and select the "Windowed" option and quit again.

Testing your CD-ROM

If you suspect your CD-ROM may actually be faulty, or damaged, you can run the file CDTEST.EXE in the SYSTEM directory of the CD-ROM. The program will then examine every byte of data in the PC partition of the disc to see if it can be correctly read. The process takes up to 35 minutes and generates a verification code if the disc passes the test. If the CD-ROM fails this test try cleaning it with a light solution of washing-up liquid, dry it with a lint-free cloth and run the test

CONTINUED



Right *Never a cross word with our powerful problem-solver, plus something for old smoothies to iron out DOS text*
Below *Uncle Walt gets into high-tech: Toy Story is the first ever full-length computer-generated feature film. This is the trailer*

again. If it still fails, return your CD-ROM to the magazine for a free replacement.

You are free to copy the CDTEST.EXE program to your hard disk in order to test other CD-ROMs, as long as it is not distributed in any way. If you are running CDTEST from your hard drive, you need to specify the CD-ROM drive to test as follows:

CDTEST D:

Note: We offer this tool "As is", purely as an aid to diagnosing possible faults, some of which may occur because an older version of MSCDEX.EXE is in use and not because of a faulty CD-ROM, and disclaim any responsibility for any erroneous error reports that it may generate.

IMPORTANT — READ THIS!

GENERAL PROTECTION FAULTS

If you receive General Protection Faults when running PCWI, or playing any digital videos, it's probably because your graphic display driver may not be totally Microsoft compatible. The answer is to install one of Microsoft's own drivers as follows (but NOT if you are using Windows 95, as the drivers supplied with it are newer than those on this disc):

1. Run "Windows Setup" from File Manager, then select "Options" followed by "Change System Settings".
2. Scroll through the list of displayed graphic drivers until you get to the final entry, "Other Display (Requires Disk from OEM)", and select it.
3. Insert this month's CD-ROM into the drive and replace the "A:\" prompt with "D:\SYSTEM\SVGA256" (changing the D: to the correct letter if your CD-ROM is not in drive D:), then press Return.
4. Scroll through the new drivers until you find the ones beginning "Super VGA…" and select the one for the resolution you prefer to use. The driver will then be installed and Windows restarted. PCWI and Video for Windows should then have no further problems.

If this works (which it should in 95 percent of cases) you may wish to contact the supplier of your graphics card to see if they have an updated graphics driver. If Microsoft's drivers don't work you will need to contact your graphics card supplier anyway.

If Video for WIndows install fails

If the Video for Windows installation fails and you receive an error such as "XXXXXXXX.YYY cannot be updated as it is a shared file", the answer is to delete the file "XXXXXXXX.YYY" (or whatever it is called) and reinstall Video for Windows.

PCWI is slow to load, or runs slowly

You need at least 4Mb of RAM free, to use PCWI. If necessary you can obtain this by creating a permanent swap file of up to 4Mb. You are also advised to enable read cacheing of your CD-ROM by adding its name to the SMARTDRV line in your AUTOEXEC.BAT file. You should also allow MSCDEX to set up its own buffers by adding a line such as /M:10 to the MSCDEX line, also in your AUTOEXEC.BAT file. Please refer to your manuals for full details.

Windows NT and OS/2

Unfortunately, Macromedia Director, the program used to create PCWI, is incompatible with Windows NT. However, you should be able to run PCWI from OS/2 by simply calling up PCWI.EXE from the command line.

Robin Nixon

PCW *Advice & Contacts*

The *PCW* CD-ROM is virus-checked at every stage of production. However, *PCW* will not accept liability for any problems arising from its use. You are advised not to install software on a networked PC before checking the disc.

For technical support on the CD-ROM and the programs on it, call the VNU 24-hour Hotline on 0891 616444. This is a computerised touch-tone advice system providing hints and tips on a wide range of topics. It also offers you the opportunity to speak to a member of our technical support staff during office hours by pressing the 0 key on your keypad. Calls cost 39p per minute off-peak and 49p at all other times (tone phones only).

Using the computerised system you can access the information you need very quickly. If you request to speak to a member of our technical support staff and we cannot answer your question immediately, we will offer to call you back at our expense.

Outside office hours you can leave us a message by pressing the 9 key. If you leave your phone number, we'll call you back at the earliest opportunity during office hours.

If you prefer, you can email rnixon@cix.compulink.co.uk, or on CompuServe: 70007,5547, or write to us at the magazine.

Personal Computer World

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154,482
JAN-JUNE '95

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VNU House, 32-34 Broadwick Street, London W1A 2HG.
Main Switchboard Tel 0171 316 9000.

Advertisement typesetting by Typematters, London N1.
Origination by Latent Image, 6 Balmoral Grove, London N7.
Printed and bound in the UK by St Ives plc, Plymouth. Distributed by Comag, Tavistock Road, West Drayton, Middlesex **(01895 444055)**.

Editorial

Microsoft is adept at seeding a product into the market to build up demand, then putting the screws on to maximise the revenue. When *PCW* first reviewed Microsoft's multimedia encyclopaedia, Encarta, in August 93 it cost £299. The price was soon cut and has been in free-fall ever since. By the end of last year it reached the point where manufacturers were paying £20 or thereabouts to bundle Encarta 95 with a PC. It became a compulsory item with every home PC sold.

Over Christmas Microsoft ran an advertising campaign for the UK version of Encarta 96. It was about a couple of girls playing on a computer in their bedroom when their father walks in and asks them which car they think he should buy. Well, maybe I'm mixing up the Encarta ad with the equally nauseating Bravo ad (or is it Brava?), but you get my drift.

After the ad campaign had kick-started retail demand, Microsoft changed its policy with manufacturers. Now they can only bundle Encarta 95, which is out of date, or the US version of Encarta 96. This puts dealers in a quandary. It's no longer viable to include Encarta 96 UK because it's too expensive. Customers complain, and there's a serious temptation for the less scrupulous not to spell out that only the US version is available.

Microsoft is no stranger to this kind of policy. Aggressive pricing and marketing of MS Office helped it to over 80 percent of the suite market. But once a dominant position was established, the price crept up. People who bought Office just before Windows 95 came out had to pay hefty fees to upgrade to Office 95. Perhaps worse is the way it treats UK manufacturers. It's common knowledge that the US companies Dell and Gateway can buy Office to bundle for less than $80, while the UK manufacturers pay around £140, well over twice as much.

Ben Tisdall
Editor

Next Month

Personal Computer World

CLASH of the TITANS

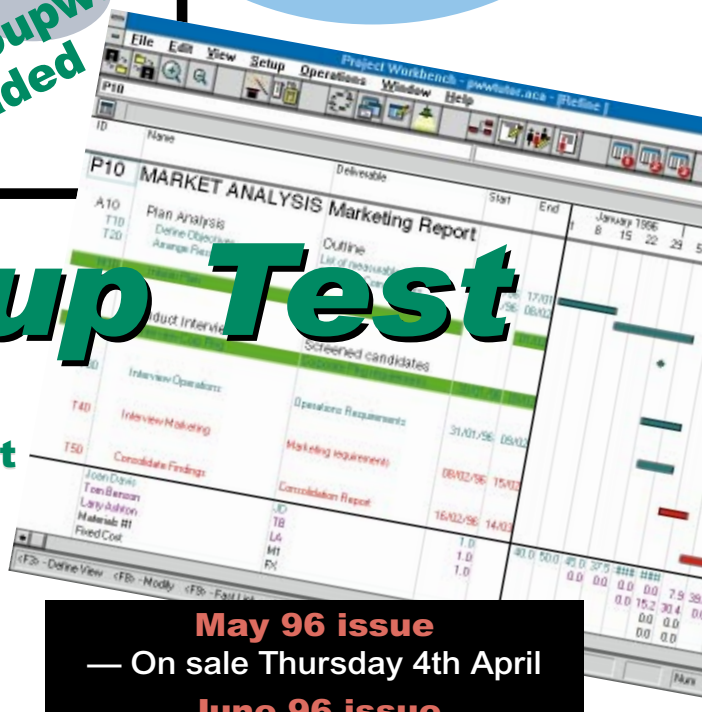
Pentium vs Cyrix vs Pentium Pro — top processor performance compared

Personal Finance Software

Get your finances in order for the start of the tax year in April

Lotus Notes 4.0

Leading groupware upgraded



Group Test

Project Management Software: 11 leading packages reviewed and rated

May 96 issue
— On sale Thursday 4th April

June 96 issue
— On sale Thursday 2nd May
- *PCW Awards*
- *Graphics cards*

** Next month's contents subject to change.*

NEC first with pioneering CRTs

NEC's new 15in M500 and 17in M700 MultiSync monitors use pioneering ChromaClear CRT technology.

ChromaClear CRTs use a slotted mask design, with elliptical phosphor shapes grouped vertically, as found on many (non-Trinitron) TV sets. NEC is the first to develop a slotted mask with a pitch fine enough for high computer resolutions; both monitors are capable of 1,024 x 768 non-interlaced at 85Hz. Ideal for multimedia, they will be available in April.

Gordon Laing

NEC 0181 993 8111

Board maker admits to using dummy cache

A manufacturer has admitted selling motherboards with dummy cache which, it says, some dealers have sold as the real thing. *Newsprint* has been flooded with letters and calls from readers who discovered from last month's fake-cache story that their boards were not all they appeared to be.

Protac International Computers (PIC) said dummy cache was used for two reasons:
1. To reassure buyers; empty slots make them feel a board is "somehow incomplete".
2. To avoid having to reprogram a production line each time it is switched from cached to cacheless boards. Marketing manager Steve Baxter said dummies saved around $100,000 a month.

They are all stamped "Writeback" to identify the boards as supporting the fast writeback strategy for using cache. But writeback operates only on the Level 1 cache inside the processor. The boards can support the larger external L2 chips, but have none on them — only dummies.

These are bought from a third party, and PIC is not the only supplier to use them. It claims to be one of the biggest board makers in the world, shifting 600,000 a month from plants in the Far East.

PIC said it never intended to "deceive or misinform" anyone. I suggested to Baxter that a court might nevertheless take the view that the dummies constituted misrepresentation. He believed PIC had acted within the law and said that it had volunteered information, which is more than other companies had done. "We are trying to be as open as possible," he said.

Baxter said that PIC had to warn only one dealer, for months, after the boards went on sale last year. He said in a letter: "Over the past few days we have become aware that some dealers are selling motherboards with dummy chips as '256Kb cache' boards, or sometimes as '256Kb writeback cache', when in reality they have zero external cache."

The letter added: "There is a large price difference between the WB (Writeback) and 256Kb cache model and it is highly unlikely that a dealer is unaware of the true specification of either."

Clive Akass

● *News Analysis* — page 36

Acorn goes for Apple turnover in UK schools' IT

Apple and Acorn underwent a form of marriage last month in a move that could spell big changes for IT in UK schools and colleges. Their surprise announcement of a new joint company, yet to be named, was the first sign of a fightback by Apple following a $69m quarterly loss and the sacking of its chief, Michael Spindler.

"Must be the first time in history that an Acorn has grown into an Apple tree"

Acorn won a foothold in UK schools with its BBC Micro in the eighties but lost ground to the PCs of Research Machines. The new company will try to woo the education market to the Mac OS running on PowerPCs. This may not go down well with Acorn fans, as it threatens the future of their beloved RISC OS.

But the new company will work to improve interoperability with Acorn's RISC OS, so that schools can use their existing machines. Both Acorn and Apple have tried to swim against the Wintel tide by sticking to their own operating systems and RISC processors.

Acorn's star has risen with a contract to make Oracle's Netsurfer box, touted to challenge the PC (*News Analysis*, p35). It set up Advanced RISC Machines in partnership with Apple in 1990 to make the processor for the Newton.

Nigel Turner, Apple Europe's director of new media, said: "We believe Apple and partners can take on the Wintel platform in key areas and win."

The new company is the first step in an Apple assault on the European education market with Acorn parent Olivetti, which has licensed the Mac OS.

Olivetti has no plans to make Mac clones, said Marco de Benedetti, head of Olivetti Telemedia, another new company, set up to exploit ATM technology. Research Machines head, Mike Fischer, said: "We are confident that the growing trend towards adopting the PC as a platform for education will continue."

Tom Waller, head of Acorn dealer, Tower Electronics, believed the RISC OS will survive by being incorporated into a common platform, giving users a choice of operating systems.

Acorn 01223 254254; Apple 0181 569 1199

More Apple news — page 30. Apple News Analysis Special — pages 32 and 33

PCW Illustrations by Kevin *Smith*

WordPerfect and ZDS move in big industry shake-out

"Sir, there's a representative of 'The Programmers Liberation Front' in reception to see you. You want I should send him in?"

The tectonic shift in the PC world caused by the Win95 bandwagon and falling hardware margins continued with a vengeance last month.

Apple's troubles overshadowed the emergence of a new PC conglomerate from the merger of ailing Zenith Data Systems and Packard Bell in a complex deal involving the French group, Bull, and NEC.

And WordPerfect, once the undisputed best-selling word processor, was bought from Novell by Corel.

Bull UK chief, Richard Snook, claimed that the new Packard Bell, in which Bell and NEC each have a 19 percent stake, will be number one in the world in terms of PCs shipped, and number two by value.

The deal is seen as a decent way to bury ZDS, for which Bull paid $511m six years ago, shortly before it fell into a sustained decline.

The move was followed by a scary farce when a sacked Packard Bell man in California forced his way into a supervisor's office and sprayed it with bullets, having urged ex-colleagues to armed revolt. No-one was hurt, except the gunman.

The WordPerfect deal could have done with some drama to give it life. Novell announced last year that it was up for sale and Corel was touted as a possible buyer. The product lost ground overwhelmingly to Word, partly because of a poor Windows début but mostly because of the success of Microsoft Office.

A measure of this success is the fact that Corel paid just $200m for Perfect Office, including Quattro Pro and smaller applications — $800m less than Novell had paid for a similar bundle two years ago.

But Corel is banking on the fact that WordPerfect still has a huge number of users worldwide, many of whom have yet to upgrade to Windows.

Michael Cowpland, UK-born head of Corel, said a new version of Perfect Office would be out shortly, concentrating on integration with the Internet.

But it can only fight for the tail end of the suites market with Lotus SmartSuite.

Colin Wyatt, UK head of Lotus, said: "Cowpland is a good businessman but I doubt if Corel can offer the kind of support that corporate clients expect."

OS/2 'will never work on the PowerPC'

IBM sources have admitted that OS/2 will never make it to the PowerPC Platform (formerly CHRP). "I don't see how it can," said the IBM contact to whom we spoke. "The performance is a dog. It's been canned because we can't make it work properly."

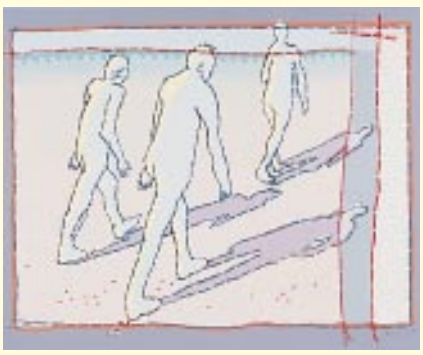
The biggest problem is the legacy 8086 microcode. Unlike Windows NT, OS/2 was never written with portability in mind. IBM's expensive, time-consuming efforts to move OS/2 to a microkernel which would form the basis for multiple operating system personalities have come to nothing.

IBM had originally promised that OS/2 on the PowerPC would go into beta in May 95. Things started to look grim for OS/2 last June when IBM released NT for the PowerPC. But as recently as Comdex Fall, in November, a senior IBM VP had still been professing total commitment to OS/2 on the PowerPC Platform.

With NT and AIX already available on PowerPC and Linux, and Apple's Copland due to follow, there's a question mark over demand for OS/2 on the PowerPC Platform. And even if IBM did sort out the OS/2 performance issues, would anybody want it?

Ben Tisdall

Coffee-table art book is available on the Web



This is one of 400 works by Paul Harmon in what is described, somewhat cryptically, as an electronic coffee-table art book. It is called Le Voyage and is "cyberpublished" on the Web.

Harmon has studios in both Paris and Tennessee. The book is at www.bookpage.com/paulharmon

Short Stories

Webbed goons

● This is one of several rare pictures of people associated with the fifties cult Goon Show that can be seen on Web pages given to ex-Goon, Michael Bentine (*second from left, above*) as a 74th birthday present.

The pages were a present from his designer son, Richard, who said: "His friends in California, where he spends the winter, have been showing him the Internet and how to use email. He is now a complete convert."

www.demon.co.uk/rbadesign/

TurboCAD 95

● TurboCAD 2D/3D for Windows 95 offers over 300 new features including full DWG and DXF read/write for complete AutoCAD compatibility. Upgrades start at £29.95. The full version costs between £70 and £99.95.

IMSI (UK) 0181 581 2000

Cheaper 1.3Gb optical drive

● Xyratex is offering Disc Direct 1.3Gb magneto-optical drives for £750, or £869 for an internal version (a price reduction of some 25 percent). Cartridges cost £36. The drives, which also take 650Mb cartridges, have an access time of 28 milliseconds and a data transfer rate of 2.3Mb/sec via a SCSI-2 interface and 1Mb cache.

Xyratex 01705 498851

LapLink mobile

● LapLink for Windows 95 offers notebook users Universal Mobile Access in one package. It enables users to work on email, remotely run applications, access files and transfer information in a single session without redialling.

Travelling Software 01753 818282

BT shifts an inch as digital kit gets cheaper by miles

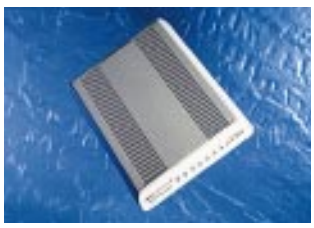
The cost of all-digital comms is dropping, with several vendors offering ISDN startup packs at near modem prices.

British Telecom has shifted slightly on its much criticised £400 installation charge — to the extent of offering large companies easy payment terms when they want to link large numbers of small offices and teleworkers by ISDN.

But Electronic Frontier is offering a £340 installation to buyers of its new £250 ISDN Internet pack which includes a terminal adaptor — making a total startup cost of £590.

The kit supports the CAPI (which treats the ISDN adaptor like a serial port) and V110 standards, but not the latest V120. "We do not believe the V-standard has any future with ISDN," said marketing director, Chris Miles.

The ISDN board lacks an analogue port, which means you cannot connect a standard phone. But it can be used with standard comms packages, including those which turn your



PC into a phone (*see page 174*).

It is bundled with Internet software, and will talk to ISDN-enabled Internet providers like Demon and Pipex using synchronous PPP at 64Kb/sec.

Racal is also offering a £250 adaptor, called the X-Toll (*see photo, top*) and plans to package it as an Internet kit. It offers similar facilities to Electronic Frontier's but adds V120. Racal says this provides a 30 percent speed increase on a standard data stream by stripping start and stop bits that are not needed in a synchronous (time-framed) ISDN stream, and replacing them at the destination. Few online services support V120.

Chase Research's £375 NetChaser adaptor (*shown left*) supports synchronous PPP and has two analogue ports for standard phones, modems or faxes.

KNX's ISDN Internet Access Kit is £495 and includes Tollmiser software to minimise line costs when netsurfing. KNX is now owned by Global Village. Lion Communications is selling ISDN phones from £150. Director, Barry Schofield, reckons prices will drop to below £100 by the end of the year.

Chase 01256 52260; Global Village 01756 702500; Lion 01689 861208; Racal 01256 763911; Electronic Frontier 01734 810600

Watchdog questions British Telecom's ISDN sign-on charge

British Telecom could be forced to cut its controversial £400 charge for a basic, all-digital, ISDN sign-on under plans being considered by the industry watchdog, Oftel.

The idea comes in an Oftel consultation document for the next round of price changes which are due next year.

The document notes that ISDN use is more advanced in France and Germany than in the UK, partly because of the greater availability of private lines here, but also because "connection charges…in the UK are relatively high."

It comments: "At present, ISDN prices are not subject to price control. There has, however, been some concern that the prices for access to British Telecom's ISDN services are excessive; that this reflects British Telecom's dominance in the market; and that they operate as a brake on the use of higher bandwidth."

It also points out that British Telecom is the only basic-rate provider in Britain, although Mercury offers a multi-line primary rate service.

"In a competitive market, prices could be expected to fall. Oftel is therefore inclined to include ISDN prices in the new price control," states the document.

Ironically, British Telecom has claimed in the past that it cannot cut its ISDN charges because the money would have to come from income from analogue lines, thereby breaking an Oftel rule against cross-subsidy.

● Comments on ISDN pricing can be sent to Chris Taylor, Consultation on Price Control, Oftel, 50 Ludgate Hill, London EC4N 7JJ.

Short Stories

H-P scanner for small offices

● Hewlett-Packard has introduced a new colour and greyscale flatbed scanner, aimed at small offices.

The ScanJet 4p has an optical resolution of 300dpi, or 1,200dpi enhanced, and costs £440. It comes with Visioneer PaperPort 3.0 software and includes text-reading (OCR) facilities and a choice of Photoshop Limited Edition for the Mac, or Corel PhotoPaint Select 5.0 for Windows.

Hewlett-Packard 01344 360000

Good newts

● Tadpole says its P1700 notebook is the world's most powerful portable PC and the first to use Intel's new 166MHz Pentium.

Tadpole 01223 428200

EasyFlow 3.0

● The latest version of the EasyFlow charting and diagramming product has been launched. Operating on Windows 95, Windows NT and Win32, the software is on special promotion for £129 until 1st April.

Roderick Manhattan 0181 875 4444

Net watcher

● WinU is a new security system with timeout and access features for Win95 PCs. There are three levels of security, including one which limits the amount of time spent on the Internet.

Thompson Partnership 01889 564601

Adobe frame-up

● Adobe FrameMaker + SGML 1.0 is the first cross-platform visual SGMLtool to simplify the authoring, and electronic publishing, of complex and frequently revised documents.

Adobe UK 0181 606 4000

Short Stories

Excel add-on

● Microsoft has launched a £79 analysis pack designed to link Excel 95 to leading UK accounting packages. It allows you to perform "what-if?" analysis on business data and view it from various perspectives.

Microsoft 01734 270000

Uninstaller 3.0

● Microhelp has shipped a 32-bit Win95 version of Uninstaller 3.0, as well as a 16-bit Win3.2 version. The 32-bit product costs £49.95. Upgrade from 16-bit is £9.95

Microhelp 001 770 516 0899

Novell sues

● Novell is suing 17 California companies for allegedly obtaining fraudulent upgrades, or counterfeiting NetWare boxes to give the impression of new products.

Electronic Giecks

● The classic reference book *Giecks' Engineering Formulas* is available in electronic form for £56 on CD (£68 on disk), with a Mathcad engine to help you solve formulas.

Adept Scientific 01462 480055

Music scanner

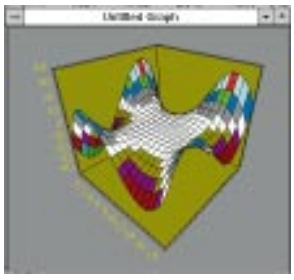
● Primax has introduced a £49 scanner package which will read printed music into a computer and translate it into an editable form.

Primax 01235 559922

Data juggler

● Stat-100, a £99 Windows package from Biosoft, includes over 100 procedures for processing, analysing and presenting data. A demo is available at www.Cityscape.co.uk.

Biosoft 01223 368622



Macromedia gets netted with Director improvements

Macromedia has announced a new version of Director, its award-winning multimedia authoring package. Release 5.0 brings a host of improvements, including a new interface standard and all-important Internet support.

Director 5.0 comes with ShockWave for Director, which allows the playback of Director movies over the Internet. Thanks to new compression technologies, developers can now produce interactive sequences complete with video, graphics, sound and text, which users can then access online.

As reported in last month's *Newsprint*, ShockWave is Macromedia's answer to Sun's Java programming language.

The package now supports full 24-bit colour on the PC when running under Windows 95 and NT. Text handling has been enhanced with the addition of anti-aliased type, RTF and ASCII text import. Cast-list files can be switched in and out, at will, from external files, and compatibility with Adobe Photoshop Plug-ins has been added.

Director 5.0 is also the first product to adhere to a new set of interface guidelines designed by Macromedia to ease working across its applications. From now on, all its software will feature common keyboard shortcuts, menu layouts and such-like, to make it easier to get to grips with things.

Other features on offer in version 5.0 include a Lingo Debugger, tighter integration with SoundEdit 16, and OLE support.

Director 5.0 will be available for the Mac, PowerMac, and PCs running Windows 3.1, Win95 and NT. Pricing details were unavailable at the time of writing.

Chris Cain

Macromedia 01344 761111

Dust and dirt downs PCs

More than nine out of ten problems tackled by computer hardware service engineers are caused by dust and dirt, according to maintenance specialist Phonotas.

General manager, Tony Roche, said many IT managers are so concerned about programs and systems that they forget about basic care.

He *would* say that, of course, seeing as how Phonotas offers a service to keep PCs, printers and other equipment in top condition. But given the state of many office and home computers, he does have a point.

Phonotas, which also offers a range of PC anti-theft devices, claims to be sole British user of a Swedish system aimed at keeping a computer clean.

The entire machine is coated with a transparent, conducting resin which is connected to earth to eliminate static — the major cause of dust settling.

The resin is also said to cut down the amount of emitted radiation.

Phonotas 0990 134255

NT animators get high-end 3-D software

PC animators can take advantage of high-end 3D software now that Softimage 3D is available on Windows NT.

Softimage claims the performance is equivalent to that of Softimage 3D running on Unix-based workstations costing twice as much as a high-spec PC.

A further release, Softimage 3D Extreme for Windows NT, should be available by July. Features will include Mental Ray distributed rendering, MetaClay for modelling organic shapes, and a particles system for creating fire, smoke and other effects.

Softimage 3D, a confirmed leader in animation on Silicon Graphics workstations, has been used in films such as Jurassic Park and games like Sega's Virtua Fighter 2. The move to Windows is a natural one following the merger of Softimage with Microsoft, two years ago.

Support for Silicon Graphics will continue. "It remains a very strategic platform for our products…and is especially important for those Softimage customers who require the fastest hardware at any cost," said Shirish Nadkarni, marketing director for Softimage at Microsoft.

Joanna Scott

Softimage UK 0171 2870708

Buoyant Compaq puts PCs back into WH Smith

Compaq has launched its latest Presario range, hoping to take an even bigger share of the booming home market.

Having doubled its consumer turnover last year, the company is selling its products through a number of high street retailers not usually associated with computers. WH Smith has been tempted back into selling PCs for the first time in five years since it was left with huge stocks of unsold Amstrads.

Compaq has also struck a deal with Toys R Us, the second biggest seller of CD-ROMs but new to the selling of whole systems.

Additionally, it has signed a deal with Asda to supply computers to schools via a token scheme, and will also be selling its products in Asda stores.

Compaq has collaborated with Fisher-Price to devise a number of ways for pre-school children to access a PC.

And for adult users, Compaq has introduced a keyboard with a built-in scanner. The scanner is licensed from Visioneer (which makes the PaperPort) and comes bundled with PaperPort software.

The new range is aimed squarely at the buyer who wants an all-in package. The machines range from an entry-level all-in-one with a P100 processor, up to a P133 mini-tower. All come with multimedia as standard, Spatializer 3-D surround sound, MPEG, and most have 14.4 fax-modems.

They have introduced a number of standard features including 8Mb EDO RAM and at least an 840Mb hard disk.

However, none of the range offers cache as standard, although you can pay £70 extra for 256Kb cache. Although you cannot have more RAM fitted before delivery, Compaq says there will be expansion room for RAM and, because it is relatively easy to fit, customers can add their own.

Adele Dyer

Imagine this in 3D...

(Illustration © John Chui / Ray Dream Designer)

This picture, called "No Fear" by John Chui, won the 1995 Ray Dream Modern Masters of 3D Grand Prize. The theme for 1996 is: Characters of Your Imagination.

Ray Dream Europe (0033) 1 69 41 97 22;
Fax (0033) 1 69 41 97 24

Accent makes some sense of Web babel

If you are American or British the Web has one huge advantage — 90 percent of it is in English. Yet much of the world doesn't speak or read the language.

With this in mind Israeli software company, Accent, has launched a multilingual Web browser as part of a new suite of products, Internet With An Accent. Also included are tools for HTML, multilingual email, and an Acrobat-like viewer for foreign language documents.

Using an enhanced version of Mosaic, the browser is able to read Web pages in their original languages, say German or French, in complete character sets. More complex, scripted, languages such as Hebrew, Arabic and Japanese are also supported using a combination of HTML extensions and TrueType font technology.

Currently, pages must be designed in Accent's Publisher software to be read by the browser, but the company has announced a plug-in agreement with NetScape so that Accent's foreign language extensions to HTML will be supported by NetScape Navigator.

Internet With An Accent is available now at around £66.

PJ Fisher

Accent Software 01923 208435
http://www.accentsoft.com

IPC-700 upgrades

IBM has upgraded its PC 700 desktop series with a number of enhancements.

Most are designed to speed performance with extra cache, 166MHz Pentium options up to 128Mb or parity, or EDO memory and 64-bit Matrox Millennium graphics cards.

IBM is making much of the networking capabilities, including Wake On LAN which allows network managers to boot switched-off PCs, remotely. An upgraded NetFinity and new infra-red ports are included.

Prices start at around £1,640 (plus VAT).

IBM UK 0345 727272

Tim Bajarin in the US

Palm pilots in a PDA winner

● A new personal digital assistant from Palm Computing (now part of US Robotics), which gave us the Graffiti handwriting recognition system, is the first PDA designed as a real extension of the desktop Mac or PC.

The pen-based Pilot measures 4.5in x 3in and weighs 5.5oz. It uses Palm's own operating system requiring only 32Kb of RAM, making it blazingly fast on the 68000 Motorola processor.

It uses two AAA batteries and comes with a cradle that connects to the desktop PC or Mac; PDA data is updated automatically on both.

I used a test unit for a week and was very upset when I had to return it.

The $299 Pilot 1000 holds 500 addresses, 600 appointments, 100 to-do items and 50 memos. The $399 Pilot 5000 holds 2,500 addresses, 2,400 appointments, 500 to-do's and 500 memos. The PC version is shipping now; a Mac one is due in May.

Palm Computing 001 708 982 5010

Gateway's 31in lounge launch

● In a surprise move Gateway introduced (in mid-February) a new, high-end PC designed for the living room. It includes a 31in Mitsubishi monitor and a stereo-rack system box.

The PC is a Pentium 120MHz box with an SVGA video card incorporating a Philips TV tuner. The PCI motherboard has three free slots, a 1.2Gb hard disk, 16Mb of RAM and a 28.8 modem. The keyboard has a Glidepoint finger mouse and can be used from anywhere in the room via a wireless spread spectrum link.

By using a 31in monitor, it should also appeal to those setting up a home theatre. The $3,995 system will be targeted at training organisations, too.

Gateway 0800 392000

Short Stories

Exchequer ports to Windows 95

● Enterprise is the new 32-bit accounting system for Windows 95 and Windows NT, from SBS Financial Systems.

It is compatible with the DOS version (Exchequer) which won our Editor's Choice in *PCW*'s accountancy software round-up in January.

Features include multi-currency accounting, open period accounting, and a unique "daybook" style for easy data entry and viewing.

SBS Financial Systems 01202 298008

Delrina suite

● Delrina has released CommSuite 95, which offers integrated applications for fax, voice messaging, telephony, Internet, data, electronic mail and paging. All of the applications are true 32-bit multitasking and multithreaded programs that deliver fast background communications.

Symantec 01628 592280

Cheaper Toshes

● Toshiba has made reductions of up to 19 percent on selected models across its range of notebooks. Prices start at £1,395 for the T2130CS, rising to £3,595 for the high-end Satellite Pro 410CDT.

Toshiba 01932 828828

Pioneer move

● Pioneer has cut the price of its six-disk 4.4 speed CD autochanger, by 25 percent, to £399.

Pioneer 01753 789789

Comdex UK

The first Comdex UK will be at London's Earls Court from 23 April to 26 April.

Softbank 0181 741 8899

Cyrix and IBM boast of P+ power

Cyrix and IBM have just announced their newest chips, the 6x86 P150+ and P166+, in conjunction with a new rating system called P+.

The new 6x86 processors run at a clock speed of 120MHz and 133MHz respectively, but, it is claimed, they outperform the Intel Pentium 150MHz and 166MHz chips.

"Within a month of Intel's announcement of its Pentium 150 and 166, we're announcing 6x86 microprocessors that deliver better performance," said Ken Torino, director of the 6x86 business unit for IBM microelectronics.

The new P-system rating has been adopted by Cyrix, IBM, AMD and SGS-Thompson in the hope that it will provide a new and standard level of comparison to the market-leading Intel Pentium line of CPUs.

Evaluations and ratings of the chips are based on the Winstone 96 benchmarks, and have been carried out by MicroDesign Resources (MDR) Labs of Sebastopol, California. Michael Slater, MDR president, says that with "the P-rating in place, a buyer can easily evaluate all PC processors for a given performance category."

Dylan Armbrust

Cyrix 01793 417777; IBM 01256 343000

Mobiles driven into a corner

The failure of handwriting recognition seems to have persuaded manufacturers that the pen-driven mobile is good only for niche markets which use the machines for form filling, point-of-sale devices, and data display.

I think they are turning their backs on the next big mass market — but, like notebook makers, they are coming up with some nice devices based on the old Wintel model.

This one was launched by Epson last month. It weighs 1kg and measures 8.9in x 8.3in x 1in, and includes all the usual desktop ports plus infra-red. There are four PC Card slots and it runs on a DX2/50 processor. Prices start at £1,600 for a mono version.

Clive Akass

Epson 01442 227000

New Pentiums promise more notebook speed

A new breed of powerful notebooks can be expected with Intel's launch of a 100MHz version of its low-voltage battery-friendly Pentium chip. The first 200MHz Pentium Pro machines are also due to ship this month.

Like the 75MHz version powering many of the latest notebooks, it operates at 2.9v internally on a 3.3v external rail, making it compatible with standard system boards.

The first silicon will come in 0.35 and slightly cheaper 0.6 micron versions, but the latter will be phased out by the end of the year. The chips are aimed at the mass market and the 0.35 version will cost $271 apiece, in bulk.

Dell and Hewlett-Packard both say they will be shipping systems next month based on the latest 200MHz Intel Pentium Pro chip. Dell's 150MHz model XPS Pro150 and the faster Pro200 will also implement ramRight, a new system for detecting and correcting single-bit memory errors.

The new H-P models are the single-processor Vectra VT 6/200, costing £4,090 with a 2Gb hard disk and 32Mb RAM. H-P Vectra XU 6/200 and the 180MHz XU 6/180 are available in both single and dual processor versions.

Dell 01344 720000; Hewlett-Packard 01344 360000; Intel 01793 403000

Toshiba and IBM lower their sights

Toshiba and IBM are going head-to-head with their latest Satellite and ThinkPad notebooks.

Toshiba's Satellite 100CS comes with a 75MHz Pentium processor, 520Mb hard disk, 10.4in dual-scan screen and 8Mb EDO RAM. With a suggested price of £1,695, it is aimed aggressively at the lower-end business market.

So are IBM's low-priced ThinkPad 365E and 365ED notebooks. They come with a Cyrix 5x86 100MHz processor, 540Mb HDD, 8Mb RAM and 10.4in dual-scan screen. Firm prices have not yet been released but IBM says that they should be under £2,000. Multimedia and TFT models are available, too.

Dylan Armbrust

Toshiba 01932 828828; IBM 0345 727272

Smutty sites may get X-certificates

A UK plan to X-rate sexy news groups and Internet sites emerged last month as US providers and civil-rights activists went into official mourning over the passing of a new anti-pornography law.

Many news pages were reversed out white-on-black to mark the passing of the law which the Electronic Frontiers Foundation condemned as an attack on free speech. Other sites carried a blue ribbon, similar to the Aids ribbon, as a mark of protest.

The American Civil Liberties Union filed lawsuits to challenge the validity of the law and many service providers protested that they would be forced to censor their sites. The X-certificate idea came from the newly-formed Internet Service Providers' Association. It says browsers like NetScape could be set up to detect the rating of a site and refuse access, to reassure parents worrying about net-surfing children being exposed to pornography and pornographers.

The plan is being discussed as part of a move by the ISPA, representing 40 of the 120 or so UK providers, to draw up a code of practice to forestall government legislation.

Spokesman Richard Sharpe, owner of service provider Hi-way, said the ISPA had already had talks with the Home Office, the Department of Trade and Industry, and the phone watchdog Oftel. "The response has been very positive," he said.

Sharpe says the government will not introduce legislation if it sees that the industry is implementing voluntary controls

ISPA is at www.ispa.org.uk

Tel-me sooner

Phonelink has revealed details of version 4.0 of its Tel-Me software, even before version 3.0 is released later this month. Currently in version 2.0 *(reviewed on page 224)* Tel-Me is an online business information service.

Version 4.0 will offer retail sales. According to Phonelink CEO Trevor Burke, this will provide direct one-to-one marketing between commercial outlets and buyers. Version 4.0 will be aimed at business buyers needing office supplies. Users of Tel-Me commerce will be able to browse products within the normal Tel-Me window and choose multiple or single units. The system will be interactive between suppliers and buyers, enabling custom discounts and one-on-one special offers. Suppliers would be able to change prices and stock instantly.

Burke believes dedicated services such as Tel-Me can succeed while fighting goes on for control of the Internet. He said dedicated online services are better able to target customers and suppliers than scattered sites on the World Wide Web.

Phonelink 0800 991155

New safeguards for talking and buying on the Web

Two more milestones for the Web were passed last month with recommendations for a new libel law in Britain, and an agreement between Microsoft and the world's two largest credit-card companies for a standard to safeguard online transactions.

Britain has some of the world's tightest libel laws — a newsagent can be liable to pay damages for a libel in a publication they have never read.

This might leave a service provider open for a libel on a Web server, making the Usenet news system unworkable, though the point has never been tested in court.

Now a Bill has been presented to the Lords, providing a defence of "innocent dissemination". This would make a service provider liable only if it fails to prevent publication, having been given the opportunity.

Microsoft, Europe Online and CompuServe seemed suddenly to realise their exposure to Britain's draconian laws and called for clarification last month. The new provisions, though drawn up before then, are broadly in line with what they suggested.

The agreement between Microsoft, Visa and Mastercard was for an open Secure Electronics Transactions standard.

John Stewart, marketing director of Internet systems integrator, Electric Mail, welcomed it as allaying fears that online transactions would come under the control of Microsoft. But he said true cybercash, with the anonymity of a physical cash transaction, was still a long way off.

"People want to buy and sell over the Internet…without divulging the type of information required to obtain even short-term credit," he said.

Short Stories

Apricot goes big on the PC-TV

● Apricot has introduced a multimedia PC-TV range, boasting a 17in monitor as standard and targeted at better-off homes.

The MS530 Diamondtron range includes infra-red control, an entertainment centre to run games and audio CDs, a 14.4Kb/sec modem, and a low-power mode that "wakes up" the PC when a fax or data message is received by phone. There are 120MHz, 133MHz and 166MHz models, with prices starting at £2,495.

Apricot 0121 7177171

Lloyds pilots Psion cheques

● Lloyds has joined with Psion to pilot an "electronic chequebook" as a testbed for electronic banking.

The test system allows Psion 3a users to send an electronic cheque, view statements, obtain balances, transfer money and pay bills.

The bank is also testing a PC-based system but the Psion version was ready first. If successful, it could be generally available by the end of the year.

John Leather, product manager for emerging technology at Lloyds, said: "We are looking at a number of ways we can implement electronic banking, including using the Internet. You can expect a lot of changes over the next couple of years."

Fast Elonex

● Elonex has a 120MHz model in its NB-500/I range of Pentium notebooks. The CD-ROM option has been boosted to a quad-speed and hard disks go up to 810Mb.

Elonex 0181 452 4444

Selling SAPS

● Dynamic Communications Systems is selling Spart-Com's SAPS system, which lets Novel, NT, and WFWG networks share one or more modems. Prices start at £166.

DCS 0117 9255465

Short Stories

IT courses 'too technical'

● Six out of ten business people believe that universities don't give IT students enough business skills, according to a new survey.

Even more believe that the content of IT courses is too technical. But one in four thought universities could do little to improve business expertise. Ninety percent of universities would like closer ties with business, says the IDC survey, commissioned by Computer Associates (CA).

CA 01753 577733

SPSS 7.0

● The new version 7.0 of the SPSS statistical software package is shipping. It uses Win95 features, including OLE 2.0, to bring about dramatic improvements in ease of use, flexibility, analysis and presentation, the company says. The base package is £695 and extra modules cost £295.

SPSS 01932 566262

Hooray for lessons

● Hooray for Maths and Hooray for Spelling, two £19.95 multimedia CD-ROMs, have been launched by Lander Software. They will run in Windows 95/3.x and MSDOS.

Lander 0141 226 5611

Crime and punishment

● Gary Marshall, 24, was fined £2,000 and sentenced to 240 hours of community service at Aberdeen last month for running computer companies while banned. *Newsprint* highlighted his activities last year.

Electronics pack

● Electronics Workbench 4.0, which provides drag-and-drop circuit design and simulation facilities, is available for £199.

Robinson Marshall 01203 233216

Kodak launches Chinon rival as digital camera prices fall

Kodak is launching its own version of the Chinon ES-3000 digital camera to compete for the growing market in medium-quality electronic photography.

We've been playing with the Chinon, which boasts auto-zoom, auto-flash, auto-focus and close-up facilities. It is easy and flexible to use but still retains the feel of a Beta product, especially the accompanying software.

The resulting pictures are good enough for Web pages, snapshots and identification. With a 4Mb flash-RAM card, you can store up to 25 640 x 480, 8-bit colour images.

But the pictures can take hours, literally, to pipe into your PC down a serial cable (roll on the new, fast, USB or FireWire ports), not least because the connection keeps timing out.

You can download just one picture or all of them, but nothing in between, so if the connection breaks down during a batch you have to start all over again.

Such irritations are likely to disappear in upgrades, especially with competition from Kodak's new DS-50. This uses a different sensor, providing resolutions up to 720 x 504.

A trade-off is that the Kodak camera is less sensitive — equivalent to 80 ASA as opposed to 200 ASA with the Chinon (one disappointment with these cameras is that they require more light than a camcorder). Also, Kodak uses an ATA-compatible RAM card which means you can stick it into any PC Card slot to read the images, without the need for a special driver.

Kodak is still developing its Twain driver, so we could not see how it compared with the Chinon. Our reviews editor will be carrying out a comparative test of digital cameras for publication in a future issue of *PCW*.

Both models sell for around £850, and Kodak has reduced the price of its DC40 to around £600.

NBA (Kodak & Chinon distributor) 01453 351970

Multimedia past, present and future

Digital photography was not available when this picture of Charles Lindberg was taken, but a photo-chemical camera was on the spot. This picture is on a CD catalogue, designed by Interactive Learning Productions, of the famous Hulton Deutsch collection. The collection was launched at last month's Milia 96 multimedia show.

ILP 0191 261 1255; Hulton Deutsch 0171 266 2660

New-look Olivetti rings the changes with multi-function fax for the office

Olivetti has entered the market for multi-functional office devices with a novel range based on a fax machine.

The Olivetti OFX models look like a standard fax, but print on plain paper using a standard bubblejet engine, and can act as a conventional scanner or printer.

They link up with a PC via a high-speed, bi-directional, parallel link. The £769 OFX 2200 and the £869 3300 differ in their paper-handling capabilities and speeds.

The new models are among the first to emerge from Olivetti Lexikon, a company formed this year to develop and sell printers and other office machines.

Olivetti has been going through a lot of changes, forming a new Telemedia company and a new alliance with Apple *(see page 18)*.

Olivetti Lexikon has also upgraded the company's bubblejets. The new models, the JP 70 portable, the JP 170, the JP 270, the JP 370 and the JP 450, all use Olivetti's new, reusable ink cartridge.

This can also be used on the company's earlier models such as the JP-150. The latest version also supports Epson and IBM emulations.

Olivetti Lexikon 01905 220111

Short Stories

$10m-a-year Amelio makes a good start

● Gilbert Amelio, the new boss of Apple, will get at least $10m a year in cash and shares for the next five years, according to reports.

He gets a $200,000 golden handshake for signing on to Apple, and is guaranteed $10m if the company is sold this year.

Apple lost $69m in the last quarter and is expecting even bigger losses this quarter with the uncertainty about the company's future.

But Amelio was credited with an immediate success by persuading Motorola to license the Mac OS for its PowerPC machines.

He announced a programme of consultation with staff and customers to identify strengths and build up confidence in Apple's future. "We are going to be fine," he said.

LCD monitor

● Tired or scared of sitting in front of a radiating VDU? RDI's standalone 12.1in LCD monitor could be the answer.

The active matrix TFT screen displays up to 1,024 x 768 resolutions in 4,096 colours and the surface area

is claimed to be equivalent to that of a 14in VDU. You can even hang it on the wall.

The model is currently aimed at specialist markets — not surprisingly, as it costs around £3,000.

RDI 01344 25999

Newsprint welcomes your news,views, Web sites and graphics. Send them to clive_akass@pcw.ccmail.compuserve.com or cakass@dial.pipex.com

Mac OS gets mini-upgrade as Copland faces delay

Following the news that the next version of the Mac OS will be further delayed, possibly until early 1997, Apple is planning a new, intermediate upgrade to its operating system.

Scheduled for release this month, System 7.5 Update 2.0 will bring much-needed internal improvements and eliminate the disparity between models, giving all of them the same version of system software.

As well as raising the version number to System 7.5.3, sources say the update will include new control panels, improved networking and memory support, a faster Finder, and more PowerPC native code.

It will also incorporate all of the major bug fixes and patches which have been released since the launch of 7.5.

Reports from Beta testers have been positive, with the new, native Resource Manager and memory management portions, in particular, receiving praise.

"There really is a noticeable improvement in performance, even on low-end machines like the 6100," said one. This update is just one of many that Apple has planned before the final release of Copland. "There is a race among programmers to get as much code PowerPC native as soon as possible." This could be crucial in the battle to prove that PowerMacs are a match for high-speed Pentium PCs.

Rumoured new System 7.5.3 features include:

● **Finder** Fast file copying: improves window handling and general Finder speed on 68040 and PowerMacs.

● **More native OS parts** Apple Guide, SCSI Manager and Resource Manager now native.

● **Open Transport 1.1** Now for 68030 and 68040 Macs; optimised for faster networking links.

● **Virtual memory** Faster launch times for applications when virtual memory is on.

● **Modern Memory Manager** Improved performance with 68K emulated applications.

● **AppleShare** Workstation Client is faster; cacheing improved.

● Lindy Electronics is offering the extended 106-key Mac keyboard for £45. It boasts two extra ADB ports so you can attach both a mouse and a graphics tablet, and has an adjustable wrist-rest.

Lindy Electronics 01642 765275

Top 10 Peripherals

	Product	Manufacturer	Last month
1	850 HDD Kit	Western Digital	-
2	Online Internet Kit	Motorola	-
3	Sidewinder Joystick	Microsoft	-
4	SoundBlaster 16 Valve	Creative Labs	-
5	3400 Modem	Motorola	-
6	Quadspeed CD-ROM Drive	Goldstar	-
7	1.2Gb HDD Kit	Western Digital	-
8	Sportster 28.8 Modem	US Robotics	-
9	Home Mouse	Microsoft	-
10	Yamaha M10 Speakers	Yamaha	-

Top 10 DOS

1	Flight Simulator v5.1	Microsoft	1
2	MSDOS v6.22	Microsoft	6
3	386 Max	Qualitas	-
4	Turbo C++ v3.0	Borland	5
5	Turbo Pascal	Borland	-
6	PCDOS Version 7	IBM	9
7	Worms CD	Ocean	8
8	Fun School Maths	Europress	7
9	Fifa Soccer 96	Electronic Arts	2
10	Antivirus Quarterly	S&S International	-

Top 20 Windows

	Product	Manufacturer	Last month
1	Encarta 96	Microsoft	1
2	Windows 95 U/G	Microsoft	2
3	Qemm	Quarterdeck	3
4	First Aid 95 for Win95	RMG	4
5	Norton Anti Virus Trade Up	Symantec	-
6	MS Office 4.2 U/G	Microsoft	18
7	Cleansweep 95	Quarterdeck	17
8	TurboCAD	ISMT	-
8	AutoRoute Exp UK & IRE	Microsoft	6
10	Printhouse	Corel	-
11	MagnaRAM 95	Quarterdeck	5
12	MS Office Pro 95	Microsoft	16
13	MS Office 95	Microsoft	-
14	Page Plus Home/Office CD	Serif	12
15	Dr Solomons Anti Virus Quarterly '95	S&S International	15
16	Dr Solomons Anti Virus Quarterly	S&S International	-
17	Lotus Passport License-Organiser	Lotus	-
18	CorelDraw 5 to 6 Upgrade	Corel	-
19	MS Plus for Win95	Microsoft	7
20	Quickbooks	Intuit	-

Figures supplied by Software Warehouse and relate to bestsellers for January 1996.

Taking stock of the situation

Apple shareholders backed Michael Spindler to the hilt, believing in his "vision", then suddenly demanded his resignation. Tim Bajarin speculates on the U-turn.

ANALYSIS

After months of backing Michael Spindler, Apple's board, including chairman Mike Markula, dumped its embattled CEO. Up until the Apple shareholders' meeting on 23rd January, Spindler had the backing of this high-powered board.

So why, only two weeks later, did the board move to replace Spindler with Gilbert Amelio, a turnaround artist who, until last week, was chairman and CEO of National Semiconductor?

The first reason was the intense outcry for Spindler's resignation at the shareholders meeting. Shareholders, financial analysts and industry leaders made it clear to the board that Spindler's perceived lack of leadership was a liability to the company's restructuring program.

Interestingly, the reason the board had been so strong in its support of Spindler was that people believed in his technical vision. Indeed, he masterminded the move from the Motorola 68000 processor to the PowerPC — generally considered a technical marvel. The board really believed he was needed to orchestrate the next major technical miracle, that of making the Mac platform open around the Common Hardware Reference Platform, aka CHRP.

But Spindler's weak management flaws finally caught up with him, and the board had to move to gain stability and give investors and customers confidence that, with the right management, Apple *could* be turned around.

The second factor was the $23 offer from Sun that came on 23rd January. Up until that date, Sun had not put a firm offer on the table. In the three months of discussions that preceded the offer, Sun had only told Apple's management that it was very interested and then hinted that the company felt Apple's worth or value was in the low $20's.

Apple contended that its stock was worth a premium over the stock's street price, ($31 on 23rd January). However, once a real bid came in, sources say Apple's board realised that Sun had no intention of paying a premium price, and they made moves to keep themselves an independent company. That meant a change in management and at that point, talks began with Apple board member Gil Amelio about taking over.

The third factor was what caused them to move so fast. Within days of the shareholders meeting, Apple began getting reports from their field sales/support staff that some major accounts were considering dropping their support for the Mac. Apple's dealers started reporting that volume buyers were putting current purchases for the Mac on hold, and hinting that they may move to the PC platform. This news caused the board to panic, forcing it to assure customers that Apple was in control and would be there to support them in the future.

Gil Amelio is known as a tough, no-nonsense manager and renowned turnaround specialist. His appointment as chairman and CEO says to customers and investors that Apple has a top notch manager in place to execute the restructuring plans.

So Gil Amelio and his staff will buckle down to try to bring Apple back from the brink of destruction. This will be a very difficult and long process, but they now have a leader with a solid reputation and assets to work with. For Apple's customers' sake, I really hope he can keep the Mac around for many more years.

Bridging the great divide

While at least 14 executives have left Apple in the last six months, the company has attracted one new executive. Heidi Roizen, former president of the Software Publishers Association and founder of T/Maker, one of the first Mac software developers, has become vice president of developer relations.

Heidi's decision to go to Apple is interesting when you realise that she is a close friend of Bill Gates and Steve Jobs. When Gates took his bride-to-be, Melinda French, and close friends to Africa on a safari two years ago, Heidi and her husband were invited along. It is pretty much a given that she called each of them and asked for their opinion before she accepted the job. Of course, Jobs would want Apple to continue to be around and, if possible, stay independent. But the more interesting twist would be Bill Gates' stamp of approval.

Sources say Gates is troubled by the problems Apple is having and wants them to succeed. Interestingly, he is not afraid of an Apple/Sun merger, which many people think would really challenge Microsoft. He is said to be more afraid that Sun would destroy the Mac platform and not keep it as a serious alternative to the IBM PC. Why would this be an issue to Gates? Clearly, the potential of more anti-trust suits or Justice Department scrutiny if Apple disappeared and Microsoft was the only real player in desktop PCs and potentially, other digital access platforms.

Although there could be other challangers in the new digital arena, the Mac at least keeps the Justice Department happy, since it is a serious competitor, albeit a small one. I would not be surprised if Heidi gets Gates to be even more committed to the Mac platform than he is today, and he becomes a real champion for the Mac through Heidi and her new role.

Race against time

Can the new boss turn Apple's fortunes around? Innovation is sorely needed, but Ben Tisdall suggests that time is not on Gilbert Amelio's side.

Put yourself in Gilbert Amelio's shoes. You've just been appointed CEO of a multi-billion dollar company but it's ailing and has lost $69 million in the last quarter, with bigger losses to come. What do you do next?

Amelio's predecessor, Michael Spindler, managed the difficult transition from the 68000 chip family to the PowerPC. What he didn't manage to do was sort out Apple's strategy for licensing its technology. Keith Harris, VP Europe at Radius, one of the few companies which attempted to produce Macintosh compatibles under the original licensing terms, said: "Their licensing efforts have been half-hearted. They need to decide whether they want to be in it or not."

The best way forward for Apple is a more open approach to licensing, to encourage volume low-cost Macintosh clones. Few people think it will do Apple much harm to walk away from the low-end sub-$1000 PowerPC business, but it's vital that the company hangs on to, and preferably expands, the Mac OS's market share. To keep software developers interested, you need a critical volume to write for. Microsoft Office on the Mac has already slipped a version or two behind the Windows version.

Some observers also think Apple needs to decide whether to be a hardware or a software company. There is speculation that it might hive off Claris, its applications division, or pull out of hardware entirely. More important is that Apple decides which bits of the hardware and software business it needs to stay involved with.

The new strategy needs a return to innovation. Traditionally, *PCW* wrote about Macs because what is on the Mac now appears on the PC next year or the year after that. Apple still spends proportionately more on R&D than most other computer companies, and far more than the other PC manufacturers. Recently though, Apple's technological promises have been failing to materialise. Pippin is a good example. Apple originally promised to get its games machine/Internet device onto the shelves by Christmas 95. It still hasn't appeared.

Finally, Apple needs to work closer still with its partners, IBM and Motorola. Above all, that means getting a Macintosh OS running on the PowerPC platform (formerly the CHRP, Common Hardware Reference Platform) as soon as possible. Apple already has it running in the lab but hasn't managed to get machines to developers. Steven Ellis, a programmer at Mac software developers MicroAPL, said: "I want one on my desk and I don't care who makes it. Firepower keeps saying they'll have one out in a couple of weeks. I'll believe it when I see it."

Apple insiders think early 97 is nearer the mark for a kosher Apple PowerPC machine. Windows NT is looming. IBM is already supplying NT on its low-end RS6000 PowerPC workstations. NT is a server platform just now, but it's only a matter of time before it migrates down to the desktop. Time is running out.

Michael Spindler isn't sitting pretty at Apple any more, after being unceremoniously dumped by the board

Amelio: hatchet or handshake?

Most observers seem to think that Gilbert Amelio's appointment puts a hold on selling Apple to Sun, and that if the company is sold, it won't be for $23 a share or even $30. Steven Ellis thinks the new CEO is the man for the job. "My personal feeling is that he's not about to fatten up the calf for the kill. He knows the technology. He may do more strategic alliances, to work closer still with IBM and Motorola."

Keith Harris at Radius said: "I think Amelio brings some renewed financial market confidence in that he's known for turning things round. I think he will make some fairly big changes, but I don't think he's a fire-sale guy. He's not going to sell it off cheap."

Apple's Steve Everhard, who heads European New Media Business Development, thinks Amelio's appointment was a natural move for Apple and poured scorn on the Sun bid. "It would be a bit like your local garage taking over Halfords," he said. "People have been sounding the death knell of Apple for 10 years. We're an enigma as far as the industry is concerned. I can't think of another product where people feel so passionately about it. That's one of the reasons why the market finds it difficult to understand us."

ANALYSIS

Acorn consults the Oracle

Acorn is to make Oracle's Netsurfer box with an ARM superchip for less than $300. Ian Burley reports.

Oracle, a large American fish, has announced a deal with Acorn, a relative British minnow, to develop low-cost Internet surfing terminals which could erode the dominance of PCs and Microsoft software.

Acorn has been contracted to develop a new generation of Oracle-inspired NCs (network computers) which will cost less than $300 to make — about the same as a mid-range video recorder. They will be simple to use and they won't be PC-compatible.

Oracle is the undisputed leader of the corporate database server market. It's a multi-billion dollar concern, but Microsoft is bigger still. If Oracle wants to keep up with Microsoft (and charismatic CEO Larry Ellison certainly wants it to) the company must find a way of earning money from the technology which sits at the client end of the equation.

Rather as performance-through-simplicity enabled RISC to all but replace CISC microprocessor technology (even CPUs with CISC instruction sets are now built with RISC architectures), Oracle wants to throw away the bloated hardware and software foundation of today's PCs. An NC won't necessarily have a local hard or floppy drive, its operating system will be on a ROM chip, and users will download software to use as and when they need it. An NC will require just a megabyte or two of working memory, and it won't even need a monitor — you'd just plug it into your TV.

But can an NC be made for under $300? Acorn has been jealously treading a proprietary cost-conscious path since 1987 with its own ARM RISC processor and ROM-based RISC operating system. Some of its Acorn Archimedes and Risc PCs have sold for as little as £400.

Acorn's Online Media division is now offering digital multimedia set-top boxes (STBs) for interactive TV applications at costs not far off the $300 target. ViewCall has contracted Online Media to supply a variant with a built-in modem, rather than the broadband ATM interface which would normally connect an STB to a digital cable TV network.

PCs cost on average $1,000 to build, a figure which has remained static for three or four years. So how can an NC be made for less than a third of the cost? Part of the reason comes from Acorn's other spin-off, ARM Ltd, which has developed a remarkable chip, the ARM7500. This 486DX2-class RISC processor has 8-bit sound, memory management, I/O management and 24-bit graphics all on one sub-$50 chip. All you need add to make an NC is a bit of memory, the operating system, a Java-compatible Web browser on ROM and a modem chip, and you're away. Digital is also developing the ARM architecture and its StrongARM versions will be considerably more powerful.

But can a TV adequately display Web fonts and graphics? Peter Bondar, who heads Acorn's Applied RISC Technologies division, says the company has been cajoling TV displays into looking like computer monitors for years, using graphics anti-aliasing. It's the same way TV companies make their graphics look good on TV. Bondar says many a cynic has returned from an Acorn demo surprised at what a standard TV display can achieve.

Bondar says the possibilities of NCs are endless. They could be hooked up to conventional PCs; they could be pocket-sized mobile devices; they could be bolted on or built in to STBs. Oracle probably won't get into the business of making NCs; its plan is to license the technology to the consumer electronics industry.

Does this all sound rather familiar? Four years ago Apple announced the Newton project which, according to then-Apple supremo John Sculley, was to usher in a multi-trillion dollar market for personal digital assistants, or PDAs.

The formula was similar, even using the same low-cost ARM RISC processor technology. Consumer electronics giants like Sharp queued up to license the technology. Yet today, the Newton is struggling for survival as a niche product. Apple itself is on the verge of collapse in the face of unremitting pressure from the WIntel steamroller. Can Oracle's NC vision fare better?

The Internet is being touted as a last chance to put the brakes on the Microsoft and Intel bandwagon. Sun's Java scripting language for compact plug-in Internet applications has caught the imagination of both developers and users, and it's platform-independent. The NetScape browser also flies the platform-independence flag. And some say a PC is an expensive and unwieldy instrument for tapping the Net.

An NC makes sense, but that does not ensure success. Dr David D Clark, a Net specialist at MIT, said recently he didn't think an NC Web-surfer was a realistic proposition, partly because of the ambitious cost targets. But he admitted that he would be happy to be proved wrong.

Oracle CEO Larry Ellison sees his company's deal with Acorn as a way of reining in the runaway success of Microsoft/Intel in the network computer market

ANALYSIS

Truth, but not the whole truth

Clive Akass reports on the aftermath of last month's fake cache story and finds buyers still risk being ripped off.

Thanks to all of you who contacted us about dummy cache. I tried to answer you all but I was on overload at times. Keep the letters coming to clive_akass@pcw.ccmail.compuserve.com; fax 0171 316 9313.

The dummy cache scandal has emerged because, paradoxically, the chips in question are being used less. Many PCs are now sold without cache chips but with EDO (extended data out) RAM, which uses clock cycles more efficiently to match the performance of cached RAM. So the fact that your board has no cache, or dummy cache, does not necessarily mean that you are losing out on performance (see below).

The demand for boards with no cache chips led to the decision by PIC and other companies to fill empty slots with dummies (see page 18). This decision was to say the least foolhardy.

It has led to many of the boards being sold on the basis of half-truths and downright deceit, leaving some vendors as well as many users feeling cheated. There are three levels of misrepresentation:

● **At the board level**. No-one has yet come up with a convincing legitimate reason why a board's BIOS, such as the one we featured last month, should report 256Kb of cache when none is present.

The PIC boards report "writeback enabled", which is the truth but not the whole truth. It means that the BIOS has turned on writeback operation of the main processor's internal cache. Graham Jackson, senior design consultant with chipmaker Cyrix, said this boosts performance, but nothing like as much as you get from using external cache as well.

He said: "I can think of no reason why anyone should use dummy chips on these boards. It is misleading and is bound to lead to trouble."

● **Downright untruths in adverts**. Pino Computers, which has branches in Altrincham, Salford and Warrington, was last month still advertising "256Kb WB cache" boards for just £45 — cheap, provided you know what you are buying. Altrincham branch manager, Sell Basi, first blustered that the figure referred to main RAM used as cache, and then admitted that the board was a PIC's dummy-cache models.

He said PIC had sent a fax about the nature of the writeback boards only the week before, and he had stopped putting "256Kb writeback" on invoices. "You ask 100 people what the terminology of writeback cache is and you'll get 100 different answers," he said

Basi claimed that he was offering to replace boards of people who complained. But computer consultant Glynn Lucas told *PCW* he met "a very violent reaction" when he returned one. "They... tried to rubbish me and had the cheek to claim that this cache was of a far higher quality. When I showed them that it was in fact false, they refused to return my money."

Reader Mike Bennett said dealers at a London computer fair last month were still claiming Writeback boards contained 250Kb of cache.

● **Economy with the truth**. We had several complaints about Eclipse Computers of Coventry. This advertises in *Micro Computer Mart,* like Pino, but with a more careful wording. Part of an Eclipse ad last month listed boards as "WB/256K cache" followed by two prices, £49/£69.

Only from the prices of boards fitted with processors could you deduce which lacked cache. I suggested to proprietor Changez Akhter that the ads, if not lying, were less than honest. He replied: "If you are a manufacturer of a four-speed car you are not going to *say* that it has four gears. You are going to highlight the good points."

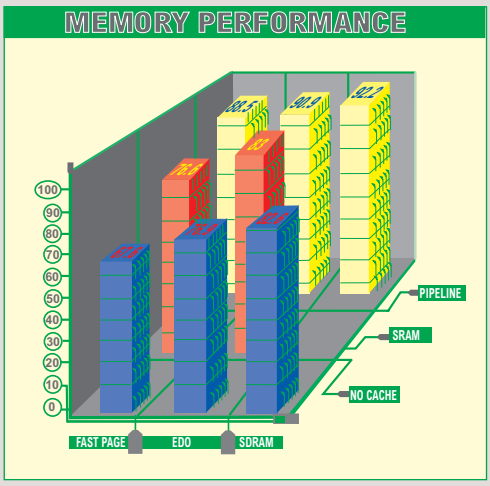
He said Eclipse had never claimed boards had 256Kb of cache when they had not. "We assume everyone knows what writeback cache is," he said. When I asked him what *he* thought it meant, he replied: "Writeback cache means dummy cache on the board."

The dummy chips on some Elite boards were soldered in, which Akhter admitted meant they were virtually impossible to upgrade.

Some cacheless boards can be brought up to scratch by using EDO, but many people buy them to upgrade a PC using their old standard RAM. A couple of readers said their "upgraded" system ran slower than their old one.

Trading standards officers in at least three counties are investigating dummy cache.

● *The full text of PIC's letter and more news will be at our Web page at www.vnu.co.uk/hc/pcw/*



Cache flow crisis

These NEC figures show the relative performance of fast page RAM, EDO and synchronous DRAM using no cache, standard SRAM cache, and pipeline burst cache. EDO RAM alone is about as fast as standard RAM with SRAM cache. EDO prices are getting down to those of standard RAM. The figure for EDO with SRAM is estimated. The faster synchronous DRAM is likely to become common next year, says NEC non-DRAM product manager Mike Hopkins.

Computations

BY ROWLAND MORGAN

Sterling mayhem

A good way of creating clean indoor work and a code-cracking new generation would be to require all US software to be rewritten and licensed for British use. Skirt GATT by writing the requirement into safety regulations. Premier Internet has just launched NetWare with Eudora email, written in the USA, and the UK version is quite capable of transmitting a £ sign as a 3. This produced interesting results in last month's Computations, namely that rubbish dumps were going to charge £32 a tonne (it should be £2) for auto junk, raising £33m (it should be £3m), valuing a plastic Eiffel Tower at £317,000 (it should be £17,000). Fortunately, it was only a magazine column, although we apologise to baffled readers. One shudders to think what damage Premier Internet could wreak with Eudora in the world of personal finance, where one rogue 3 could cost thousands of pounds. Premier Internet is packaged with Hayes International modems.

● **Source: Premier Internet technical support**

STATELLITE

The world's computers use more electricity than Switzerland

World computer electricity consumption per year in kilowatt hours: 240,000 million

Switzerland's gigawatt\hour capacity: 51,701

● **Sources: Hutchinson Pocket Dictionary of the Environment, London 1994/Euromonitor, European Marketing Data & Statistics 1995**

There's no such place as away

Ever dumped a TV or computer monitor? Once it's busted, that's the end of recycling. Fact is, the only way a TV or monitor can be recycled is by carefully packing and shipping it. Where to? (Remember, there's no such place as away.) You could jumble all the units into one collection centre, but then how will dismantling ever be automated? The only logical place where the kit can be dismantled on an economic scale is where it was made. Pack it, ship it, transport it to Kuala Lumpur? Okay, there is a cathode-ray tube-dismantling cottage-industry, but a Korean picture tube plant the size of ten football fields (1.2m sq ft) is to open in Scotland (promised jobs costing about £79,000 each to create). Silicon Glen? Six CRT production lines will give a total production capacity of 10 million tubes a year, or 82 per minute, but plans make no mention of recycling.

● **Source: Scottish Enterprise**

League of Nations

The nation-state is over, announce MIT economists (somehow the US remains the biggest nation-cult on Earth). What is happening to our UK "region" is plain. A glance at The Times 1000 list shows that four of the world's 50 biggest companies are in computers, but no computer company features among Britain's top 100. IBM (American) comes 108th, earning £275,000 a year per employee. ICL (Japanese) is, keep going, 254th, earning £104,000 a year per employee. Keep going down, all the way down, and DEC (American) is 314th, followed by Compaq (American) at 391st. (Compaq brings in £611,000 a year per employee.) Amstrad is at 422nd (£303,000/employee).

● **Source: The Times 1000**

To have and to have not

Britons have half as many computers as Americans, and 134 times more than Indians. The figures are: Americans: 265 computers per 1,000 population; the UK: 134; India: 1. This looks like deprivation, until you consider it from the Indian point of view. An Indian typically accounts for 33 times less polluting oil than an American. If you apply that relationship to human numbers, the population of the USA is the equivalent of 8.7 billion, and the whole population of India matches that of Los Angeles.

STATELLITE

For every railway station, there are seven petrol stations and a 29-mile queue of motor vehicles

Railway stations on BR: 2,506 With ticket sales: 1,316 Petrol stations: 18,500 Motor vehicles: 25.6 million

● **Source: British Rail/BP/DVLA (10K MV @ 15ft)**

● **Source: Lester R Brown et al, State of the World 1994, Worldwatch Institute,Earthscan/ David Nicholson-Lord, Resurgence No. 17**

Green Configuration

Compaq Prolinea 5120 PC	
Energy Saving:	Blue Angel
Take-back:	Pilot schemes
Polymer Codes:	Yes
Packaging:	30% recycled

Kyocera FS 400 Ecosys printer	
Energy Saving:	Energy Star
Recycled Paper:	Warrantied
Recycling:	No cartridges
Take-back:	No
Packaging:	Styrofoam-free

STATELLITE

If all Germany's PCs were Blue Angel energy savers, and they all switched to hibernation mode, they could still use enough power to run seven major car factories while dozing.

● Sources: Compaq Computer Ltd/Powergen advertisement (10m @ up to 30W; Toyota Burnaston plant 40mW)

Sounding Off

Forget Crunchy Nut Cornflakes, Ricicles or hi-energy muesli. If you really want a "lift" in the morning, nothing beats a cheque in the post.

Or the promise of one. So when an email came through, saying something along the lines of "Thank you for sending us your features on restaurants and pubs which we've recently published, please have lots of money", it got the day off to a flying start.

Until I reached the end of the message. There was the usual yours sincerely and the editor's name. Then the name of his publication. It turned out to be one of the UK's more notorious porno magazines; the type that makes *Penthouse* look like The *Catholic Herald*'s colour supplement. What on earth were my features doing in there? It seemed as likely as *Practical Plumbing* running a piece on animal husbandry.

Theories circulated with the breakfast muffins as my Interior Design Consultant and I discussed the matter. The most likely explanation, we concluded, was that I'd filed two different pieces of copy to two different publications simultaneously, but had got their email addresses confused. Each had therefore got what was intended for the other. Which begged the question: if the porno magazine had got my features on restaurants and pubs, who the hell had ended up with the Danish nympho nuns piece? And, more to the point, how come they hadn't said anything?

It couldn't have been *The Mail on Sunday*. The section editor would have complained about its having too much of a Scandinavian bias. It wasn't *PCW*, either. Although, after due consideration, they might have published it, Ben Tisdall, or one of his minions, would undoubtedly have phoned me up beforehand to ask me to beef up the computer content a little. And The Sunday Times still retains the quaint old practice of having a copy-taker. I'm sure I'd have remembered dictating "Well-stacked Sister Dominica, 38-24-36, has

MICHAEL HEWITT

a very peculiar habit ....."

In fact, I have never written a Danish nympho nuns piece at all, or indeed anything that would have been remotely suitable for inclusion in one-handed literature. So there had been no confusion of email. Somehow, maybe while in autopilot mode or drunk, I'd found the mag's email address, mailed them my stories, and then forgotten all about it. Or had I?

Could it be, asked my Interior Design Consultant, that someone was extracting the urine in a big way? Was the email just a practical joke? It was possible, I agreed. (Ever since I published my email address in here some months back, I've had lots of weirdos writing in.) But if so, the promised paycheque was unfortunately a joke, too. Damn it. There was only one way to settle this: I'd have to buy a copy of the magazine.

Although my local WH Smith boasted a well-stocked, well-thumbed top-shelf section, they didn't have the title I was seeking. According to the lady at the till, it wasn't company policy to sell it. Too much competition from the Internet magazines, probably. She suggested *Playboy* as a less physically-demanding alternative. No luck there. Eventually I stumbled upon a side-street lottery-cum-news vendor. And on his top shelf, right alongside *Fiesta* and *PC Direct*, was the mag in question.

Yes, there I was, wedged between various colourful gynaecological studies. It was a reprint of a piece I'd done some years ago for a men's "lifestyle" glossy. So, yippee, my cheque was indeed in the post. As, obviously, were several other cheques to other journalists, too. Flicking through the pages I noted articles — on fishing, gambling, travel, cars — that, on the face of it, had no connection whatsoever with the subject matter of the magazine. They, and I, were merely light-relief from the hand-relief.

Anyhow, I've since been in discussion with fellow hacks. Apparently, it's not uncommon for this sort of thing to happen. The Net is to blame, of course. Online freelancers regularly upload examples of their work to places like CompuServe's JFORUM, in the hope that a passing editor might come upon them and offer a commission. In that respect, we're rather like those Hollywood wannabees who dress up in their finest and hang around bars and restaurants, hoping to attract the attention of a Casting Director.

It sometimes happens. On many occasions, however, our pieces simply get ripped off and used without payment. Given the sheer diversity of publications worldwide, online and printed, and their number, there's every chance we'd never find out. I certainly don't scan all the UK's girlie mags, for example, in case someone's purloined my words of wisdom.

On this occasion, it was just fortunate that the editor in question was an honest sort. But maybe there are others who aren't, and, unbeknown to me, I'm currently adorning the pages of some Scandinavian or Far Eastern exotica, or equivalent Web site. If you're a reader of such and you do come across me, I'd be grateful if you'd drop me a line. Discretion guaranteed.

Homefront

There was a time when, if you wanted to have a telephone conversation with someone in a company, you had first to survive the obstacle of the receptionist. There was obviously a course, where they learnt skills such as unhelpfulness and the contraction of normal English sentences into a single word. Intensive voice-training would perfect that bored, irritable whine that is strangely reminiscent of tearing linoleum. A diploma from the Academy for Telephonic Obstruction carried the same sort of CV-kudos as a degree in Business Studies from Harvard, and would be rewarded by a vital defensive position in a corporate hierarchy — protecting its members from the enemy.

Conversations would go something like this:

Miss Ann Thrope: "Kray Mummy Parshi."
Me: "Is that the Creative Multimedia Partnership?"
Miss T: "I juss SAID."
Me: "Can I speak to Mr McDonald, please?"
Miss T: "Name?"
Me: "Mr McDonald."
Miss T: (sighing) "YAW-er name..."
Me: "Oh — my name is Tim Nott."
Miss T: "From?"
Me: "From my office."
Miss T: (audibly annoyed) "Regarding?"
Me: "Sorry?"
Miss T (realising she is talking to an idiot): "Wossit REGAR-ding."
Me (foolishly): "It's regarding I want to speak to him."
Miss T (rapidly losing patience to the point of uttering an entire sentence): "What Do You Want To Speak To Him A Bout?"
Me (suicidally): "I think that's a matter for me and Mr McDonald."
Miss T (vindictively): "Canyold please."

The line would then go dead, preventing me from the satisfaction of taking my two-million pound order elsewhere.

Such finely-tuned obstructive skills are, it's sad to say, dying out thanks to advances in telephony. I recently needed some product information from a company specialising in communications. I dialled the number for the company's press office. There's an old adage about the cobbler's children being worst shod, and this was obviously the high-tech equivalent: communications were not this company's strong suit.

TIM NOTT

A recorded voice regretted that the number I'd dialled was not in service. So, forsaking press privilege, I dialled the company's main customer service line. The technique of making a victim listen to an endless loop of synthesised Vivaldi, interspersed with "You are being held in a queue for..." was originally developed by the KGB. With the Soviet break-up and end of the cold war in sight, an enterprising commissar sold the technology to the west, whose scientists augmented the torture with the brilliant idea of making the victim pay. After only a few minutes, a human answered and I asked to speak to the person concerned. It turned out she had left, but the helpful (how standards have slipped) receptionist provided me with another name and two further telephone numbers. Both of which were wrong. The cagey weariness of the private subscribers who answered indicated that this was not by any means the first time this had happened.

So back to customer services. The receptionist gave me a new number and apologised for the mix-up. I'm sure Miss Thrope would never have made such a mistake — and would certainly not have been so unprofessional as to admit it.

So, I dialled the new number, and connected with the dreaded electronic voicemail announcement. My contact was not at her desk, but I could leave a message. Another, rather bossy, recorded voice — possibly the Principal of the Academy for Telephonic Obstruction herself — then took over. "If you want to leave a message, say 'Message', otherwise remain silent." "Message" I said, clearly, and feeling rather sheepish. Nothing happened for a while, so I started leaving the message. I was interrupted by bossy-boots again. "Please enter a password." A what? Is this the press office of a large company or more KGB technology? I tried once again to leave a message, but back came bossy-boots. "You have waited too long before entering a password. Your call will be terminated. We know where you live and will be sending someone round to deal with you."

Well, all right, I made that last sentence up, but that was very much the way I was made to feel. And I'm supposed to be au-fait with all this technology. The point is, some of it, and voicemail particularly so, isn't just user-unfriendly, it's downright hostile and rude. And worst of all, you don't even get the chance to be rude back. If I'm going to be insulted and patronised, I want a human being to do it. Come back, Miss Ann Thrope — all is forgiven.

Straight talking

Why do so many people still use standalone fax machines, instead of PC modems? Because most of the PC fax software is so rotten.

I have tried any number of fax software packages. Some were bought, others came free with modems that I have bought, and several more were sent for review.

Not one of them seems to have been put together with real-world needs in mind. They are unreliable, working with some modems but not others and refusing to connect with some fax machines. They can't fulfil basic commonsense needs. They soak up tens of megabytes of hard disk space, often on a library of fancy cover sheets of which few people will even be aware. Simply by being so big, these packages make themselves unsuitable for use where they are often most needed — on a budget portable.

Recently, I have been sending out enquiry letters to software sales companies and their public relations representatives. I ask whether they offer a "Holy Grail" fax software program that meets a few basic requirements. The software should not consume large amounts of hard disk space and thus be suitable for use on portables as well as desktops. At the very least, it should offer the option of a minimum installation without, for instance, the world's biggest collection of unwanted cover pages. It should allow the user to prepare a fax in a word processor by printing it direct to a fax file. But the fax software should also convert and send a pre-prepared ASCII text file. That way it can be used with older word processing packages for which there is no modern print driver support. Any old word processor can export plain text.

BARRY FOX

The software should allow the user to type a short text message for immediate faxing, perhaps as an extended cover sheet. And it should keep a file copy of whatever message is sent, and a transmission report. It should offer a preview of what you are sending, so that you don't send a rude letter to the wrong person.

It should drive the fax-modem into sending handshake tones for a reasonable period of time after the remote phone has answered. Then, a fax switch at the remote phone could route the incoming message to a fax machine. This then has to take the time to answer, and to handshake.

I would have thought these requirements were reasonable and obvious to anyone who actually uses a PC. But apparently not. Some marketing and PR people, who haven't a clue what they are selling, have offered me packages to try out that would merely waste my time. Others have admitted defeat. Most have simply ignored the requirements. Not one company has been able to say "Here is one that does the job".

If anyone out there knows of a Holy Grail package, I'd be pleased to hear from them. If it really works, I'll pass on the good news so that others can buy.

The easiest way to get in touch with me is by fax, on 0171 483 3074. It's a bog-standard standalone fax machine because I still find it easier to use than any of the PC packages.

Better the devil we will come to know

Tape streamer prices are now in a death spiral. The makers know the future lies with disc, Write-Once CD, and then high-density DVD. Streamer tape is painfully slow to format, write to, search and restore from. Capacity per QIC cartridge has been outstripped by hard disk growth. New tape formats promise more capacity, but why should they be any more reliable? An error towards the end of a tape backup can ruin the whole attempt. The error messages provide no real help on the cause of the error. Usually, they positively mislead. Although tape is cheap, the precision cartridges used to house it are devilishly expensive.

Beware, too, hidden compatibility problems between machines and the physical damage which drives can inflict on tape. When I hit difficulties a while back, Verbatim offered some revealing advice.

The drive senses the end of the tape using three pairs of holes physically punched through the tape. Light from an LED bounces off a mirror in the cartridge. If the sensor gets dirty it misses the hole, so the motor drive pulls the tape off its anchor to the spool.

If the formatting information laid down by the heads on one machine does not exactly match the head layout on another, back-up tapes may work only with the drive on which they were made.

Factories pre-format cartridges on high-quality machines that have been adjusted to very tight tolerances. Playback tolerance is not as critical, so a factory-formatted tape should work equally well on all domestic drives, even cheapos.

Inevitably there will be problems with low-cost disc writers. But with 650Mb capacity (and several gigabytes from DVD) and much faster searching, I reckon this is a case of better to avoid the old devil we know, and move on from tape to the new devil disk.

Business matters

I have left HCI, to become Director of Technology for PHAMIS, a health care systems company based in Seattle. This is my final Business Matters, where I look back over three years of the column, applying the benefit of hindsight.

NICK BEARD

Business Matters was about managing computers. It was based on real experiences, from the midst of a big project: in March 1994, a large new hospital opened in Scotland. At some £180 million, Health Care International was one of the largest ever start-up companies in the UK.

It had a troubled life. Marketing failures and poor bank confidence meant the receivers were called after around six months of operation. After two months of receivership, a new company, HCI (Scotland) Ltd, was born, with the Abu Dhabi Investment Company as new owners. After almost a year, the company finally found a new CEO to bring some desperately needed experience and informed leadership to the new company.

The information systems at HCI were designed to be, and remain, among the most advanced health care systems in the world. They make extensive use of PCs to bring clinical data to the desktops of doctors, nurses and other health care professionals. The plan was that there would be no permanent paper medical records at HCI; everything would be stored on computers. We largely succeeded in this.

Judging by *PCW* correspondence, some of the views expressed in this column were contentious: for example, that "users" are not necessarily the best final arbiters of what is the best technology for the job; that open systems does not necessarily mean Unix; that one word processor is as good as any other; and that generally, people should not write their own software. For some reason, HCI's approach to buying PCs particularly irritated one reader, Alan Stuart of Glasgow, early in 1995. Astonishingly for a PC seller, he seemed to think that being required to respond to a request for proposal, to quote a fair price, and to commit to a level of service is tantamount to "being made to jump through hoops". Sadly, he did not cite a company name, so Scottish readers will have to investigate further to determine which supplier to avoid.

What mistakes did I make? I failed to make a strong enough case for more investment in training clinical staff in systems skills. Despite this, most staff managed to make the substantial changes in working practices that the systems required: ceasing to rely on paper case notes and lab test forms was a wrench for many.

The pain of having allowed Digital's PathWorks and DECnet into the building continues to be felt at HCI. Purchasing X-terminals, even the small number I bought, was an error. Both decisions were reasonable ones, but hindsight proved them to be wrong. Maybe the X-terminals can serve as Internet access devices.

The biggest mistake, however, was in failing to read the small print of Digital's warranty more carefully. HCI is almost a DEC shop: not because "we always buy DEC kit", but because it worked out that way. DEC PCs were available at a competitive price in a commodity market. HCI bought over 300 Digital PCs. Were we happy with them? Generally; but around ten percent of the monitors proved defective, and, at the time of going to press, Digital do not want to know about it. When so many monitors failed, we expected the three-year warranty to kick in. Oh dear — fine print.

In the DEC world, PC systems and monitors are separate things. Only the PC system unit is covered. The monitor only has one-year cover. There is nothing illegal about this, but it is hard to see it as the behaviour of a reputable company. "Fine print" is where the disreputable hide their intentions. Good business relationships are based on trust — you know the other person is not going to rip you off, so you don't try to rip them off.

When tempted to do business with Digital, beware. Perhaps Digital will do the honourable thing — it remains to be seen.

Special mention goes to Luton-based Cerner Corporation and to Glasgow-based Informatics, without whom the project would not have succeeded.

HCI has been a fantastic experience: the company might have gone bust but the systems survived, and kept going through the troubles. Hopefully, some of my experiences have been useful to PCW readers who might be starting their own projects.

From next month, the Business Matters column will be written by Brian Clegg.

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Letters

Book 'em, BT!

You wrote that we can now buy a BT phone book on CD-ROM for £199 (Newsprint, *PCW* February). This would be a ridiculous purchase for the home user, so I wonder if BT might adopt an alternative train of thought?

Magazines such as yours give away CD-ROMs not just once a year, but every month. If BT could register home PC users who were willing to accept its phone book on CD, this could save tons of paper in printing, many gallons of diesel in transportation, provide better service to the end-user, and even save BT money.

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Clarion call

I enjoyed your Visual Programming group test (*PCW,* February) but I was surprised at the omission of Visual Objects. Given that this is Computer Associates' attempt to drag Clipper into the Visual Programming world, it must be regarded as an important product and I would have liked your opinion. Top Speed's Clarion was notable by its absence, too.

The review also ignored the question of product stability, which is of great interest to developers. I know, from my experience with Visual Basic 3.0 and Delphi 1.0, that these are both rock-solid products. PowerBuilder, on the other hand, seems to be the subject of more GPF horror stories than all the other products put together. I have no idea how many of these stories are mere disinformation (I have never used PowerBuilder) and you could have helped here.

Chris Hall
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Tim Anderson replies:
PCW *reviewed CA's Visual Objects in February '95. Since then, the product has not substantially changed, apart from maintenance releases and a new lite version. We did look at the latest release which, at the time of the group test, did not run at all under Windows 95 — a problem which I am told has now been fixed. We will look again at the 32-bit version 2.0, due for release later this year.*

The other point you make is more problematic. Bugs are a developer's nightmare and no product is entirely free of them. But it is hard for magazines to report sensibly on the subject.

Firstly, isolating the precise cause of a problem is often not trivial, especially on PCs with their infinite variety of hardware configurations and Windows setups.

Secondly, the release of patches and maintenance releases means the information may be obsolete by the time it is printed. A better approach would be to conduct a survey of developers who could report on the reliability of the tools they use — perhaps an idea for a future issue. In the meantime, online services such as CompuServe are ideal for up-to-date information on bugs and workarounds.

Why V.34 on the Net?

Phew! Am I glad you picked the Motorola 3400 Online as your Editor's Choice (V.34 modems group test, *PCW* February). I bought that modem a few weeks ago (£190) and would have been well miffed had you picked something else, or if your report had showed it to be a product to avoid.

What prompted my mail message is a concern not addressed in your article, about the need for V.34 at all on the Internet. I have been using NetScape v2 16-bit with Windows for Workgroups and v2 32-bit with Windows 95, and the best peak throughput figure I have ever seen (as monitored by NetScape) is 7.8Kb/sec.

Blimey! Semaphore can't be much slower. What is the point of a modem that can do 28.8mph if the Internet can only manage 7.8mph? It's a waste of time, innit?

Mike Hicks
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nethead.co.uk

The Motorola 3400 Online

Geoff Marshall replies:
I agree there are times when the Internet is so slow that you wonder why you spent the extra money on a V.34 modem. There can be many bottlenecks, including the fact that some service providers do not themselves have sufficient bandwidth into the Internet to cope with peak numbers of users.

Nevertheless, the Internet has grown organically and some nodes through which data must pass are overloaded at peak times. This is not the fault of the service provider; merely that data has to travel halfway round the world through many nodes to reach you.

It is also possible that you have fallen foul of the UART problem mentioned in the feature because Windows is a difficult environment for high-speed comms if you don't have a 16550. Try accessing your service provider's home page and downloading something from its Web server. If you still aren't getting V.34 speeds then there's something wrong at one end of the modem link, such as an inadequate serial port.

You can find out what type of UART you have by using Microsoft Diagnostics: type MSD at the DOS command prompt and select COM PORTS from the menu.

Come the resolution

I recently bought a Logitech PageScan Colour scanner (review, *PCW* March) and had no problem setting it up under Windows 95. My PagePlus 3 software automatically knew it was there. I have not yet tested its faxing abilities, but it scans very well and the copying is fine, too. Just one point: the technical spec states that its resolution is 200dpi. That is the maximum resolution for colour picture scanning. The maximum text resolution is 400dpi.

Geoff Cox
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Nuts in March

Has *PCW* taken to making up bogus letters to fill space? In reply to Steve Dodson's letter ("Bargain board blues", *PCW* March), I find it hard to believe that anybody could be so naive as to buy electronic equipment outside the UK when he obviously wouldn't know how to change the batteries in a torch.

He then has the stupidity to tell half the English "reading" world not to mention to British Telecom how he broke the law by connecting an unapproved modem to the Public Service Telephone Network.

Who would believe that anyone would spend money on "numerous" phone calls to the USA which would probably cost more than the £42 this nut has paid for his modem?

Incidentally, due to major differences between our telephone service and the American one, not to mention the different PSTN plugs used in this country, no amount of software is going to sort out his problems. And finally, how did Steve Dodson email Reveal with no modem?

Anyway, nice mag. Good price. Keep it up.

P.S. This guy didn't help design Milton Keynes, did he?

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Blurred vision

Both Tim Nott's Homefront column and Simon Rockman's article on Sainsbury's virtual store (*PCW* March) imply that online shopping, with delivery to your door, could be the way of the future.

There is a central fault to this vision. The people for whom Internet shopping would be most useful are busy people. Why are they busy? Because they work full time and are therefore out all day. So where will your groceries, wine and suchlike be delivered?

I recently purchased an item via mail order and was out when the Parcel Force van arrived. I drove eight miles (return) through London on a Saturday morning to retrieve it from their depot — and spent five minutes in a queue.

There is a Sainsbury's store less than a mile away from me, ample car parking and it's open late.

David Thorpe
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Obscure components prove hard to repair

About two years ago I decided to purchase a laptop. After considerable investigation I settled on a machine that had all the features I wanted, at a good price. The service from the company was excellent and I was so happy with the laptop that I purchased a second one for my son.

Now things have started to go wrong. The company appears to have gone bankrupt and I need my machine repaired. It still works fine but the problem is the battery. Like all good Nicads it has lost its memory (or gained one, I'm not sure which) and the floppy disk drive has a hard time finding some of the tracks. I know they are there, but the floppy probably has failing eyesight.

How do I get it repaired? I have already worn out two pairs of shoes, a phone and a fax machine contacting anyone who would listen, but it would seem that my floppy and battery are non-standard and not used by anyone else.

As I am an engineer, I am now planning to build the laptop into a slimline case so it will not be wasted. But if anyone knows the location of a TEAC FD05HF630U Floppy Drive or a 15-A1200-03-00 12v 2000mAh Nicad, made in Hong Kong by GP, I would be grateful if they would contact me at my email address.

The moral seems to be, pay a bit extra for the brand names: at least you may get spares, even if they are expensive.

John Steel
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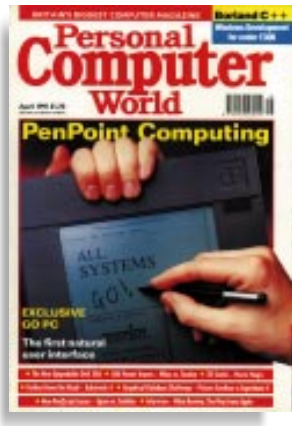
Hindsight

10 years ago, April '86

"The Spectrum 128 has many original features but is sadly lacking in some of the 'basics', such as a screen and a disk, which might have been expected of a Spectrum upgrade. Guy Kewney finds out just what is offered in return for a high price tag."

Update

The high price tag referred to was £179. The Spectrum 128 was an improvement on the old 48Kb Spectrum, though, and boasted extra goodies like a RAM disk, no dot crawl on a television, a serial printer socket, and a space bar that worked. Clive Sinclair, the man behind the Spectrum, has long since left the computer market.



5 years ago, April '91

"GO Corporation believes that the combination of a new input device and a new operating system will open up new fields of personal computing... Unlike many previous excitements, it seems solid and fully thought out."

Update

Many companies have lost a lot of money on pen computing but it has yet to break out of its vertical market niche. The Go Corporation was later bought by AT&T before development of its Penpad finally ceased.

Time out

It's 30th January and I've already read the March issue. Can't something be done to bring *PCW* back into line with reality? How about a leap issue?You could call it "Fifth Quarter", or even "March II".

David Young
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Class ACT!

I was overjoyed to see a PIMs group test in your March issue. Over the last two years I have been involved in rolling out an ACT! system across our company. At the start of the project I looked at most of the products on the market and decided ACT! was ideal. Since then, I have installed and trained about 200 users and the product has stood up well over time. We have started a roll-out of the mobile link, which completes the whole system for our remote workers.

I wish to point out a couple of inaccuracies in your review of the scheduling in ACT!. While you are correct in saying that it only shows diaries in 15-minute chunks, you can change the length of

activities by five-minute units. If you try to schedule two activities, the program will warn you of the conflict and give you the chance to accept or change the times.

Your reviewer also mentioned the lack of provision for timeless activities. This can be found at the end of the day-planner, within the activity schedule.

I agree that the other programs may have some benefits, but as the majority of my users are computer novices, the ability to complete a contacts card without using the keyboard is a huge advantage.

In defence of Symantec, it has produced five minor upgrades in the last 18 months, which have been free, and addressed some of the most requested enhancements. The general view throughout our company is that ACT! is pitched at the ideal level for the beginner, yet has enough features to make it indispensable to the more advanced user.

Andy Fison
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The Great Truth about database design and customer service

You state in your News Analysis article "Some service, no smiles" (February): "At Dell and Gateway…the database holds a history of each customer, their past purchases and enquiries." I have experience of both these companies and they have taught me a Great Truth about database design: the best-designed database in the world is of no use if staff will not use it.

Dell's reputation for great support took a severe shaking in the books of this long-standing customer, as I had to repeat a complex but non-technical problem five times, to five people, all of whom assured me it was logged yet none of whom found a trace of any previous record. It took nearly three months to sort out but we are once again on friendly terms.

I read the letter in the December '95 issue ("Gateway to hell") with a sense of encouragement, as I felt less frustrated to know that I was not alone in my suffering while dealing with Gateway.

Gateway's problem is not one that can be attributed to staff hours and lack of continuity. It may be that every time I got hold of a staff member, they listened but then simply forgot what I said. However, there are several small but telling indications to the contrary.

Whenever I speak to someone there, they are largely ignorant of my problems. They cannot access information unless I give them the order code. Then they want to know: "What seems to be the problem?" They sympathise, and tell me that it's really a problem for someone else, who will… go on, guess what I'm going to say next… "ring me back".

Gateway's customer service database is either technically flawed or just not used. Each time I ring, I tell whoever I speak to that they have my address spelled wrongly; yet the bills keep coming to "Newcastle apon Tyme" (*sic*), with no postcode.

So, either the software Gateway's customer service department uses is inefficient, or there is another explanation. I suspect what happens at Gateway is replicated in many offices. Someone installs software to do clever things. The staff who have to implement it manage to press the right keys until the trainer leaves. Then, being reluctant to use the software, they adopt the attitude that it's someone else's responsibility.

Another explanation is that Gateway is incompetent as a company. Or maybe nobody there knows how to change a misprint in a customer address. Which explanation would you prefer?

Philippa Sutton
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Getting it right about RSI

Sofa so good

Thanks for an interesting and thorough article on RSI and how to avoid it (*PCW* February). I have been very aware of RSI since my early days in computing: I can remember having spent hours at a stretch punching up PL/1 decks on the old-style hand-punch.

I agree with virtually all your conclusions, especially the realisation that the mouse may turn out to be the chief culprit. It is depressing to watch apparently intelligent people fishing around in menus when Alt-F-P-<Enter> would have had the document away to the printer in a tenth of the time.

My only major disagreement with you is over your comment on portables — this reads like a piece of received wisdom that no-one has bothered to test. Both myself and my colleague occasionally subject ourselves to long bouts of concentrated software development. We have found that the combination of Dell laptop (decent-sized tracker ball, lovely keyboard) and a sofa provides by far the best ergonomic combination for the all-night programmer — the feet must be up on the sofa, of course. The only snag is the odd looks you get from staff at the Laura Ashley shop.

Adrian Smith
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Two specs are better than one

Thanks, *PCW*, for your article on RSI. There are plenty of topics on the periphery of personal computing that are not covered by the computer press, so it's good to see some useful information being passed on.

In the related "RSEye" box, by Drew Cullen, I was interested to read about the comment regarding spectacle lenses — particularly as I'm an optometrist. The best bit of advice was that if you are a heavy user of VDUs and are over 40, then you will almost certainly be better off with two pairs of spectacles: one specifically for the screen/deskwork, and another for everyday life. Because of this, the European legislation you mentioned in the main article puts the onus on the employer, not the employee, to supply a pair of spectacles specifically for VDU use.

In the UK, employers will typically provide about £40 towards the cost of such spectacles. It's amazing how many people I see who are not aware that they are entitled to such benefits under the law.

Nevertheless, most people are convinced that one pair of spectacles can fulfil all needs, so when you explain that two pairs is ideal, the majority think this is simply a way of extracting more money from their wallets! Additionally, £40 doesn't buy you anything but a pair of single-vision lenses and a very basic frame — you don't usually get anti-reflection coatings or varifocal lenses.

A final point is that task-specific varifocal lenses are available from *all* opticians, not just Specsavers as the article suggested. And, there is more than one brand available, although Truvision Technica is one of the better known ones.

Neil Fraser
100645.357@compuserve.com

Gadgets

PCW Gadget Photography by David Whyte

Hands up who thinks PCs look boring. Okay, then how about this "wedge" system from Packard Bell, which fits snugly in any corner.

It's not just a pretty face: the standard configuration is fitted with a Pentium 75 processor, 8Mb of EDO RAM, an 850Mb hard disk, quad speed CD-ROM drive, 16-bit sound card, 14in monitor with mounted speakers, 28800 fax-modem, radio, and even an infra-red remote control. Phew! That lot will set you back £1,799 with the VAT already added. Give **Packard Bell** a call on **01753 831914**, or pop into your local Alders, Currys, Dixons, John Lewis or PC World.

Packard Bell 907D "Wedge"

The world's lightest mobile phone has been unveiled by Motorola. Weighing just 87g, the StarTac uses a system of stackable Lithium ion batteries; if you want a longer battery life, just stack another battery on the back. Billed as the phone so small you can wear it, the StarTac can currently only be used on the American mobile phone system but, based on Motorola's track record, versions compatible with UK and European systems are likely.

Motorola UK is on **0500 555555**, but it's unlikely they'll know much about the StarTac.

Motorola StarTac

It's pretty fair to say that most word processing and DTP users work on A4 portrait-orientated documents, and equally fair to say that the majority own landscape-orientated monitors. In order to view full-size A4 portrait documents, you've had to invest in huge and expensive 21in monitors. But thanks to ADI those days could be over, with the world's first 17in swivel monitor for Windows.

Simply rotate the display, press a hotkey and the image instantly flips to match the new orientation. No restarting Windows and it works with most graphics cards. The MicroScan can do a non-interlaced resolution of 1024 x 768 at a flicker-free 76Hz, and is expected to cost around £699 on the street.

ADI Systems UK 0181 236 0801

ADI MicroScan 17X

Iiyama Vision Master Pro Lite

Great big cathode ray tube monitors are all very well, but they're, er, big. Companies have been selling the flat screens found on notebook computers as desktop CRT alternatives for some time, but they've had small displays, are expensive, with limited resolutions and colour depth. Until now. Iiyama has released its Vision Master Pro Lite 31, with a relatively large 12in active TFT display capable of running at 1024 x 768 in 262,0000 (18-bit) colours. Iiyama bundles the dedicated graphics card required, with 2Mb video memory, in PCI or ISA bus versions.So Iiyama has sorted out the size, resolution, and colour issues, but it's still fabulously expensive — £2,299. Call **Iiyama** on **01438 745482**, or read our full review next month.

Hewlett-Packard OmniGo 700

Reviewed this month as a *PCW* exclusive (page 126) the OmniGo 700 allows Nokia digital mobile phone users to communicate via cc:Mail, a simple terminal and the SMS system used by mobile phones. It can even charge the phone when the OmniGo is plugged into the mains. Expected price £800.

Hewlett-Packard 01344 360000

The Japanese have the disposable cash to spend on expensive gadgets. That's why IBM launched its highly desirable Palm Top PC 110 in Japan only. But this is no ordinary palmtop: it's a fully functioning A6-sized 486SX PC complete with Windows 3.1, keypad and pen input panel. Weighing only 630g including lithium battery it also includes Personaware, an IBM PIM software suite which you can view on its 4.7in LCD colour display which doubles up for pen input. You want connectivity? How about full Internet access, an IR port and a telephone jack and microphone built-in so you can use it as a phone.

Currently, IBM has no plans to sell the Palm Top outside Japan. Base configuration starts at 169,000 yen (that's just over a grand), return flights to Tokyo from around the same price.

IBM 0345 727272, http://www.ibm.com

IBM Palm Top PC 110

First Impressions

First Impressions pits two colour inkjets in the clash of the desktops (p60), plus there's a taster of Intel's latest range of Overdrive processors (p56). Dazzle your friends with your own home video-editing suite (p66), and turn your kids into trainee Tarantinos (p58).

Contents

VNU European Labs

VNU Labs tests cover every kind of hardware and software including PC hardware, printers, network products, modems and software applications. The tests are continually developed and enhanced to reflect hardware and software developments.

Our tests closely simulate real-world use. For example, our suite of PC benchtests uses complete versions of industry-standard Windows 95 applications — currently Word, Excel, WordPerfect and FoxPro. We also run a graphics re-draw test using CorelDraw 6, and a Doom 2 frame rate test which is a good indication of games performance.

Application tests are the backbone of all the VNU Labs system evaluations but it's nearly impossible to pin an application result to a specific machine component. Only system-level tests (also known as low-level tests) can reliably tell the difference. VNU Labs' system-level test suite is called Euromark. The tests, which are mainly Windows-based, are used to isolate specific components like hard disks, graphics cards and CD-ROM drives.

● To make them easy to read at a glance, all graphs in *PCW* are drawn so that the bigger the bar, the better the result. Normally we'll also include the original data we worked from: for example, the time in minutes and seconds to print a page in a comparative test of printers.

Intel Pentium Overdrive processors

Pump up your Pentium to keep pace with processor progress.

Intel is forever clocking up the speeds of its processors. The company has now introduced a range of Overdrive processors to ramp your existing Pentium up to speeds comparable with its currently-fastest chips.

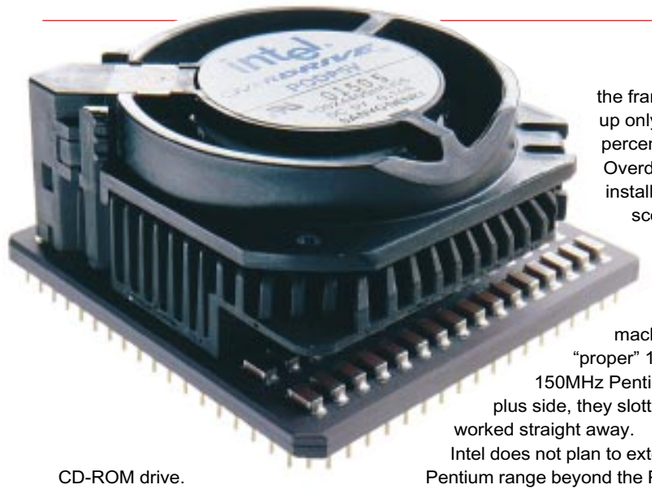
This range of Overdrives will clock a P60 to 120MHz, a P66 to 133MHz, a P75 to 125MHz, a P90 to 150MHz and a P100 to 166MHz. The first three should be available as we go to press, but the latter two will not be on sale until May. We tested the 120, 125 and 150MHz ones.

Intel has been making Overdrive chips for some time, starting with DX2 upgrades and the big-selling 486, to Pentium Overdrives. The new chips have been introduced as a way of painlessly prolonging the life span of the average PC. Applications are becoming increasingly power-mad. If you've already increased your RAM, the only choice remaining to you is either to buy a new machine or upgrade your chip.

While new chips may be fitted on some boards, there are inherent difficulties. Since P60s and P66s run at a different voltage to the rest of the Pentium range, you cannot simply slap a P120 chip onto a P60 board. The P60 and P66 Overdrive processors therefore include a voltage regulation module which takes the 5v input down to 3.3v. Whether you can upgrade later processors, such as the P75, depends on what type of board you have and how proficient you are at changing jumpers and crystals and playing around with the BIOS.

Intel doesn't claim that the Overdrives are going to exactly match the original chips. The company's iCOMP (Intel Comparative Microprocessor Performance index) figures and our own Doom tests show that the performance of the P60 with an Overdrive doesn't entirely match that of a P120 processor, scoring only 877 against the P120's 1,000 in the iCOMP tests. The gulf between the P66 with an Overdrive, and the P133, is 132 points in the same tests.

Much of this discrepancy is due to the other components on the motherboards. P120s are designed to run with improved chipset and cache, and improved system components like better hard disk and CD-ROM drive.



Otherwise, according to Intel, the Overdrives for later chips perform at the same rate as their big brothers. Thus, the P75 Overdrive performs like a P125, the P90 Overdrive like a P150 and the P100 Overdrive like a P166.

Running our Doom tests, we found the frame rate went up only by about 20 percent when each Overdrive was installed. The scores also fell short of the results we have seen in machines with "proper" 120MHz and 150MHz Pentiums. On the plus side, they slotted in and worked straight away.

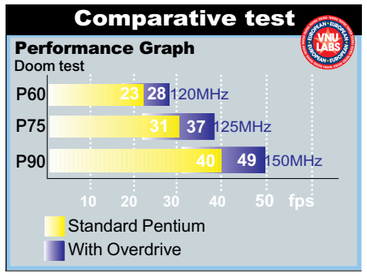
Intel does not plan to extend its Pentium range beyond the P166, but it has future Overdrive plans for the P120, P133, P150 and P166. The P120 and P150 processors will be clocked up to 180MHz; and the P133, P150 and P166s will run at 200MHz with an Overdrive. Additionally, Intel is looking at future upgrades for the Pentium Pro.

Adele Dyer

Comparative test

Performance Graph

Doom test



PCW Details

Price (UK prices not available at the time of writing)120/133MHz Pentium Overdrive $399; 125MHz Pentium Overdrive $399; 150MHz Pentium Overdrive $499; 166MHz Pentium Overdrive $679
Contact Intel 01793 431155

Good Points Definite speed improvements.
Bad Points Not quite up to the real thing.
Conclusion A worthy upgrade to flagging Pentiums.

SOFTWARE

Microsoft 3D Movie Maker

Lights. Camera. Action! That's what your kids will be yelling once they get a hold of this innovative entertainment package. Perfect for budding Hitchcocks or Spielbergs.

Microsoft's 3D Movie Maker combines all the features you'd want to stimulate your child's creativity. There's entertainment, education, fun and wonderfully vivid graphics all joined together in an easy-to-use click and point interface to help your child make animated features.

The journey begins with an introduction by McZee, a purple-coloured usher with the strangest American-Scottish accent who guides the user around the theatre and studio. He's a happy-go-lucky bloke, always ready to act as a helper throughout the package. Then there's Melanie, a normal young girl who acts as a tutor in the technique of making films. The combination of these two characters makes learning and using this package fun and easy to use.

Make your characters come to life by simply clicking yout mouse

Installing the software is easy, it took three minutes from the CD-ROM, and any configuration or file transfer is automatically taken care of. To run 3D Movie Maker you need a minimum 486SX/50 processor, 8Mb RAM, dual-speed CD-ROM drive, 16-bit sound card and Windows 95 or NT 3.51 or later. I ran it on a Pentium 120MHz with 16Mb of RAM, Creative Labs Vibra 16 sound card, and quad-speed CD-ROM drive under Windows 95 and it ran flawlessly.

You can watch your funky movie creation in the theatre

Your movie-making career starts backstage of the theatre house. Here you have the choice to enter four areas: projects, studio, ideas and the theatre (which is what we in the UK call a cinema). Melanie resides in the projects room, and it is here that she walks you step by step through the process of directing your own movie. She shows you how to create scenes, select actors, move camera angles, insert dialogue and sound effects and combine all of this together to make an animated feature. The lessons are clear and easy to follow and most children will catch on after one go. Once you are comfortable with this, you can move on to the studio.

It's in the studio that all the action happens and where we had the most fun. To begin with there are 12 scene locations to choose from, with varying camera angles to give you about 100 different scenes, all vivid with a surreal twist. There's a large choice of actors and no limit to how many you place in a scene. All action is directed by simply pointing on the action icon and selecting your movement.

Once this is done, all you do is hold down your left mouse button, move your actor around and, *voilá*, you've got action. The same process holds true for all the other effects, such as props and sounds. Choose click, drag and away you go.

As you, or your child, become more accustomed to 3D Movie Maker you can start to make some very complex and sophisticated animated features. Instead of selecting pre-recorded dialogue you can record your own, but be sure to have a decent microphone on hand for clear sound.

You can delve into the finer points of post-production by editing your film any way you like. You can change the order of scenes, add credits with special effects, synchronise actions and change scene angles and transitions. And if you've got the ambition and stamina, you can create as long a feature as your hard disk will allow.

To top it all off, you can go to the Ideas room and use the Splot Machine, which is like a slot machine, to generate film ideas if your imagination happens to run dry.

Once all is done and you've wrapped up your feature you can go to the snack bar, grab some popcorn, round up family and friends and head for the Theatre to view your masterpiece.

On the whole, this is one of the most interesting and innovative child-orientated packages to come out from any software house for a long time, and we'd recommend it to anyone with a multimedia PC. Rarely has one package united the entire *PCW* office for such a laugh.

Dylan Armbrust

PCW Details

Price £39.99
Contact Microsoft 01734 270001

Good Points Easy to learn, vivid colours and fun to play with.
Bad Points There aren't any.
Conclusion A must-have for those multimedia-orientated families.

HARDWARE

Lexmark Colour Jetprinter 1020 vs Epson Stylus Color II

Little and large — two colour inkjet printers head to head.

The battle of the colour inkjet printers is on, and this month's contenders are the Lexmark Colour Jetprinter 1020 and the Epson Stylus Color II. You may have seen the aggressive ad campaigns lately and wondered which machine was better — let's check them out.

We looked first at the Lexmark and were immediately struck by its stylish design and small 360 x 208 x 198mm footprint. It occupied very little space on an otherwise cluttered desk. The vertical paper-feed tray, with a sliding paper support built in, holds up to 100 sheets of plain paper. It can also handle paper media of virtually any kind, ranging from, say, index cards to transparencies.

The Epson Stylus Color II is not as pretty or as demure as the Lexmark. With its boxy shape and substantial 433 x 234 x 156mm footprint it easily out-sizes its opponent — and that's without the output tray being extended. You need to insert a vertical paper support into the paper tray, and while this isn't difficult, its design is not as neat as the Lexmark's.

Good value and simple design make the Lexmark stand out

The ink cartridges (one black and one colour) are easy to install and exchange via the printer software or button control on the printer. No output tray exists, so the printed pages drop directly onto your desk. If you're working late and feeling lonely you can enable the sound effects (if you've got a sound card) so that the Lexmark will talk to you when it runs out of paper or needs a cartridge change.

An added bonus is that Lexmark includes a Centronics printer cable in the box, something most manufacturers don't provide.

The Epson has two ink cartridges inside, but changing them proved more of a trial than expected. Our review model had old cartridges that had dried out but not emptied, so we tried to change them. There's no software utility for this in the Epson, so you have to do it manually; after many attempts at doing it the official way, we gave up and used the power-off shortcut. After that it worked fine. Epson doesn't provide a printer cable, which is too bad considering that it's a much higher-priced machine, and it won't talk to you if you're feeling lonely.

Vivid colour printing compensates for the Stylus Color II's shortcomings

The print quality between the two was harder to judge. The Epson could print plain text at 360dpi, a half page faster per minute than the Lexmark, but the quality difference was negligible. On the colour printing side, it produced far more vivid images of drawings and photos than the Lexmark when utilising high-quality coated paper, especially when printing at resolutions of 600dpi or above. But when using plain paper, the situation reversed and the Lexmark produced a superior colour image.

The choice between the two is tough, but basing our decision on standard home use, the Lexmark comes out ahead. It's about £140 cheaper, comes with a printer cable, doesn't take up much space and provides good quality colour images (if you're not too choosy).

Dylan Armbrust

PCW Details

Lexmark Colour Jetprinter 1020
Price £199 (anticipated street price)
Contact Lexmark 01628 481500

Good Points Great price with printer cable included. Compact size.
Bad Points Colours not as vivid as Epson's on high-quality paper.
Conclusion Good value for money. Nice style. Respectable print quality.

Epson Stylus Color II
Price £339
Contact Epson 0800 289622

Good Points High-quality vivid colour printing on quality paper.
Bad Points £140 more expensive than the Lexmark and it's larger, too.
Conclusion A reliable printer but lacking in extras. Overpriced for its class.

SOFTWARE

Norton pcAnywhere 32

It's easy to use, it's robust, and it should be near the top of your shopping list.

Remote control is one of those applications that people never realise they need until they use it for the first time. From the earliest programs that simply allowed you to control a DOS-based PC slowly over a modem, the latest are all-singing, all-dancing tools suited to everyone from the occasional tele-worker to the corporate help desk.

Norton pcAnywhere 32 is the latest version of the long-established Symantec product, capable of running under both Windows 95 and Windows NT. In addition to the usual remote control facilities, it provides file transfer and supports connections via modem, shared modems, serial and parallel ports and several types of network, including Vines, NetWare, NetBIOS and TCP/IP. This allows the user a wider range of options that most of the competition.

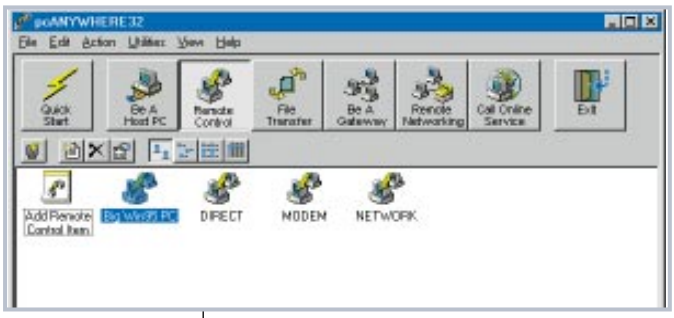
Installation is straightforward but oddly, it restarts your system both before and after, and there's an uninstall applet provided, too. Uninstalling has been a problem with remote control software in the past, leaving virtual screen drivers and other such information lying around to slow down your system.

When it's run, the program presents a window with buttons to choose between becoming a host, calling another computer for remote control or file transfer, becoming a gateway, or calling an online service.

This last is an extra feature, and allows you to use the one program to access text-based services such as CompuServe or Cix. It's fully featured, with an impressive array of terminal types including less common ones such as TeleVideo and ADM3a, but on a slow machine (one of our test systems had 8Mb of RAM; Symantec recommends four as minimum) you'll be better off using HyperTerminal.

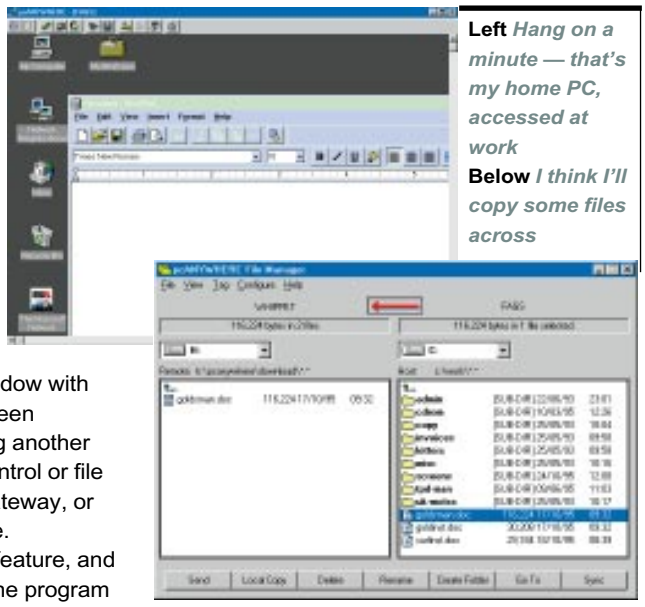
Part of the reason for this is that whenever you start a function from the main window, pcAnywhere appears to close itself and then launch an auxiliary application to perform whatever you've asked of it.

Configuring services is easy. Extensive use is made of Wizards to ensure you can get up and running quickly, supplying the minimum amount of information. However, it does pay to look more closely at the properties; if you define a host, the default setting will allow all users full access to your computer. Defining a user name and password is simple, but you really should be made aware of this beforehand.



Configuring pcAnywhere — set up a host PC, operate by remote control and transfer files

Symantec claims that many features have been added to speed up remote control: if you're using wallpaper on the system you call, it's not displayed when you call in, to save transferring bitmaps; and colours can be mapped, enabling you to control one system from another, even if they're both running in different graphics modes.



Left *Hang on a minute — that's my home PC, accessed at work*
Below *I think I'll copy some files across*

Nevertheless, performance still isn't wonderful. Using a V.34 modem, attempting to run a basic program such as WordPad on a remote system was pretty slow. If both systems are faster you'll have more luck, but I still recommend it. Even over a network, the performance wasn't anything special, although it would certainly be adequate for a help desk wanting to check a system's configurations.

Rather more useful for people who want to do real work is file transfer, which provides a pair of windows side-by-side; one viewing each PC, so you can drag and drop files between the two. It's also possible to synchronise directories and arrange for only the changed portions of files to be updated.

Performance here was very good. Even with the serial port on one of the systems set to 57,600 bits per second, transfer of a 100Kb Word document took under 20 seconds, achieving a rate of over 6,000 characters per second. Copying a whole directory of shorter files took longer, as the individual files didn't compress too well. Over a network the transfer rates weren't as high as we'd expected, with some files only twice as fast as via the modem.

This is a friendly package to use. It's easy to set up and has support for a decent range of networks. It's generally quite robust and provides everything most people will need, but on an older machine you won't find the performance to be as special as the box might lead you to expect. With a modern PC, however, and rather more than the 4Mb minimum memory suggested, you should have few problems.

Nigel Whitfield

PCW Details

Norton pcAnywhere
Price £149
Contact Symantec 01628 592320

Good Points Easy to set up and configure. Support for a wide range of networks
Bad Points Needs rather more than the suggested 4Mb memory.
Conclusion A good choice, but still not quite fast enough.

HARDWARE

Hewlett-Packard CopyJet M

Such an obviously brilliant thing to do, it's amazing no-one has done it before.

Actually, they have. The Canon CLC-10 (also sold by Olivetti) was a device which combined scanning with printing to produce a colour copier, but that cost £5,000. The new HP CopyJet is less than half that price and yet produces excellent results. Our quality tests revealed it produced better output than its 560c sibling, the well-respected Epson Stylus, and even the £8,000 Hewlett-Packard ColourJet laser.

As a high-quality inkjet this printer excels: it did particularly well when printing reversed out (white on black) text where it was on a par with a laser. Given the way ink tends to spread, this is impressive. The weakest aspect was the printing of a mottled photograph and concentric rings, but by this time we'd got very fussy. The print engine is the same as the Hewlett-Packard 1600c and uses the same cartridges, giving a print cost of around 5p per copy.

HP has been promoting its philosophy of MOPping — multiple original printing. Instead of printing one copy of a document and heading for the photocopier, you print all the copies you want on the Hewlett-Packard printer. The CopyJet is designed to fit in with this: it will, with the optional board, sit on a network and churn out multiple copies. That card also has an AppleTalk interface and works with an optional PostScript SIMM.

The CopyJet is a cheap colour photocopier which gives acceptable results. This technology is moving on apace: it wasn't long ago that you'd pay £5 a copy in a copy shop for the kind of output the CopyJet takes in its stride. Taking an example — designed by the Royal Mint to be exceptionally difficult to copy — reveals that the print and scan quality are exceptional. Since this activity is illegal, only part of a note was copied and magnified. The results were then destroyed in a test which showed that the ink is not particularly colourfast. Paper quality aside, the copies wouldn't pass under normal light since the colour match was quite poor.

For run-of-the-mill colour copying, the CopyJet is exceptionally good value — and it doubles as a good colour printer. We did most of the testing with the standard photocopy paper we use in the office. Special inkjet paper and supplied HP acetate produced better results but they are only really necessary for special presentations.

The CopyJet will handle paper from 16gsm to 90gsm. It's not as tolerant of materials as some of the Tektronix printers, and the manual warns against using paper which has been through a laser printer since toner will damage the CopyJet.

For installation, the scanner has one simple lock and you just have to insert the ink cartridges into the printer. A plastic panel has to be popped on the front. This could and should have been done in the factory, but since most furniture now comes as a kit to build a cupboard or wine rack rather than the item you thought you were getting, why should a printer be any different?

The biggest surprise is that the CopyJet isn't a scanner. You can't get a digital image out of the device and on to a PC or Mac. The argument is that in a networked environment, where you might have several people printing and some people copying, it would be very difficult to control who was doing what if the extra burden of scanning was included. This seems a great shame, as in many of the environments where a colour copier would be of the most use — design studios, for instance — a colour scanner would be a good idea. It might add a couple of hundred pounds to stick a SCSI port on the back, but that wouldn't mean too great an increase in the price of *this* machine. A fax card would be another obvious addition, and these two gizmos must be imminent.

Simon Rockman

PCW Details

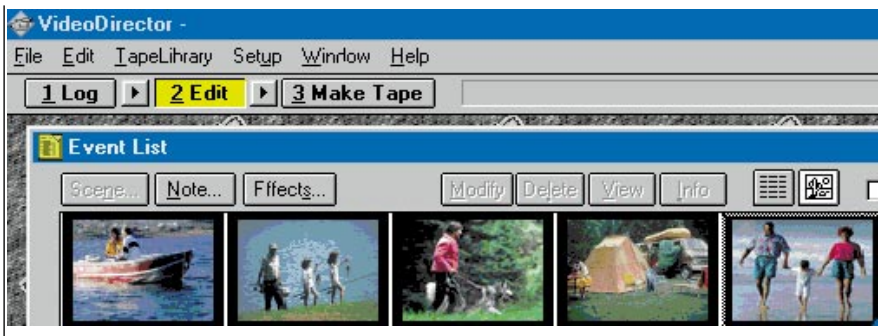
Hewlett-Packard CopyJet M
Price RRP £2139 (Centronics); £2559 (Mac with PostScript)
Contact Hewlett-Packard Information Line 0990 474747

Good Points Great print and copy quality.
Bad Points Keeps scans to itself.
Conclusion Nice for a niche.

SOFTWARE

Video Director Suite

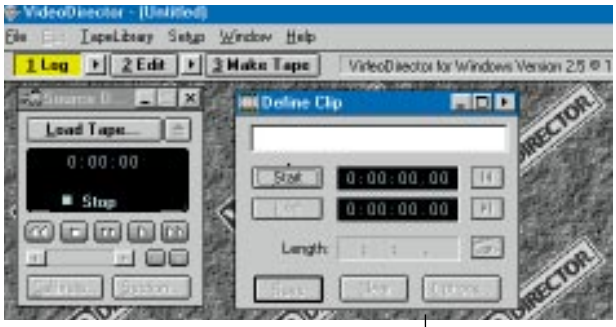
Do your friends groan when you suggest an evening watching your home movies? This will help.



With a video capture card, Video Director displays your clips

Wagner operas, according to Rossini, have lovely moments but awful quarters of an hour. The same thought may have crossed your mind when viewing other people's camcorder tapes, and they may well be thinking the same about yours.

In professional video editing, the editor goes through all the material, lists the start and stop times of all the sections they want to use, to produce an Edit Decision List (EDL), and the clips are then automatically transferred to the master tape for the final program editing. Gold Disk's Video Director aims to bring that facility to users of home camcorders and VCRs.



VCR-like controls are clear and easy to use

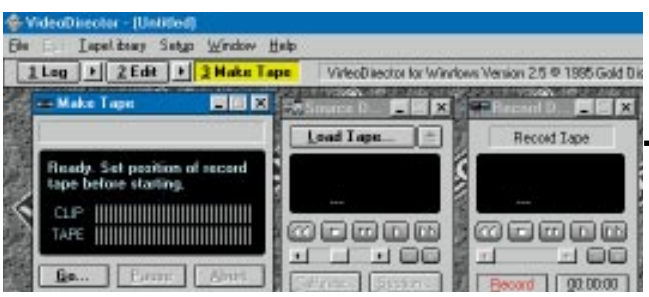
Video Director comes as a control program on floppies with the "Suite" of additional effects, clips, titling and animation software on CD-ROM. Also in the box is an infra-red (IR) transmitter that hooks up to the serial port on your PC (this may be a small problem if you have an internal modem; you will have to disable it and reconfigure the serial card while you are using Video Director).

Domestic VCRs and camcorders do not have the accurate time-code functions that pro gear uses to control the tape down to a single frame. So, to be able to get back to the start and stop positions, Video Director models the action of the video to predict, with reasonable accuracy, where it is on the tape at any one time, simply by calculating the time the machine has been spinning the tape forward or backward.

To get Video Director working requires just a 386 with 4Mb of memory, as you can use the TV to view the edit points. However, if you have a better machine with a video capture card, you can use your PC to view the edits and add the effects, animations and titles.

Setting it up requires entering the details of your VCR and camcorder to be controlled using Director's IR transmitter or the wired LANC jack, although you really need to use relatively modern recorders that have the right IR/LANC control. Also, newer machines tend to be more predictable at finding the right spot on the tape.

First, you log all the clips by using the on-screen transport controls to find the start and stop points of each one you want to keep. While you are doing this, the start/stop times are registered in Director's clip list, ready for the second stage: creating the clip list for the final tape by adding, removing and rearranging the clips in any order.



Video Director automatically finds and copies all your clips

With a plain vanilla PC you will then be rearranging clip filenames. If you have a video card, you can use Picons (Picture Icons) which show the captured first frame of each clip. The last stage is the transfer, which is done automatically.

Using the EDL, Video Director puts the master recorder (the VCR) into record and plays the first camcorder clip into it. It puts the VCR back into record/pause while it searches for the next clip on the list, then switches the VCR into record and transfers the next clip until it is all done.

Video Director is a belt-and-braces solution to a problem that can only be really solved using expensive time-code gear. Like the best belt-and-braces solutions, it has had the benefit of a lot of people trying it, fixing problems and adding new tricks. Now at version 2.5, it has turned into an effective bit of software.

With a good VCR, the system can run to an accuracy of three or four frames (a fraction of a second). It is practical, expandable if you add the video cards to your PC, works easily, and the software is about as clear as it gets.

Tim Frost

PCW Details

Video Director Home-Edit software/IR controller
Price Video Director Home- Edit software/IR controller £42.50;
Video Director Suite Edit software/Controller + Titling/animation/effects software £85
Contact Gold Disk 01734 814230

Good Points Cheap, cheerful solution to stringing video clips together.
Bad Points Must be used with a camcorder that has LANC or IR control.
Conclusion It's no pro suite, but it does an adequate job at a bargain price.

SOFTWARE

Gamma Unitype World

Be lost for words in many different languages.

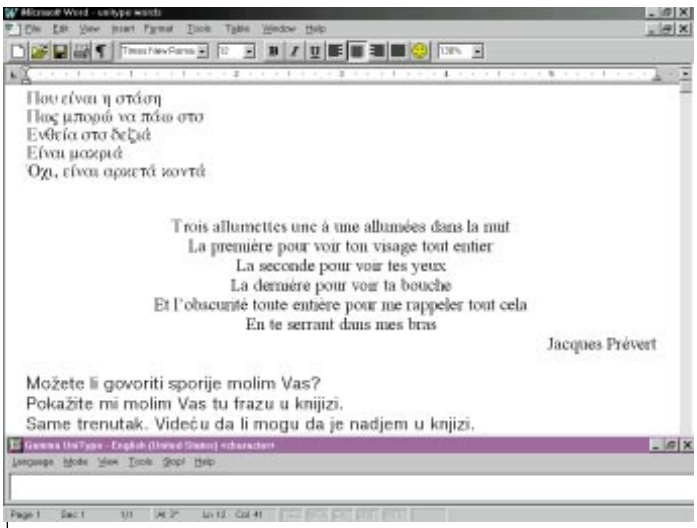
Gamma specialises in multilingual applications. The company started about ten years ago with a DOS multilingual package used largely by academics; Unitype continues that trend.

The basic premise behind the package is to let you type in the language and typeface you want, in the application you want. On loading, you get to choose from a huge list of languages. The box boasts of 175, but we reviewed the £99 World version with only 60. The International version includes Arabic, Hebrew, North Indian languages, Armenian, Thai and Vietnamese, but the cost shoots up to £299. There are also versions for classical, biblical and scholarly languages, and Korean, again for £299. In the World version you cannot type in Hindi or Tamil, but there are such beauties as Chechen, Tongian and Macedonian.

The installation lets you choose the languages you want to install and adds the appropriate TrueType fonts and keyboard maps into your Windows directory. From there you can access them as needed, not just in your word processor but in any application that takes type, including databases, spreadsheets, drawing and DTP packages. It is not possible to apply the special language character shapes or accents to existing fonts. Consequently, for variety, each language comes with at least one serif typeface, such as Times, and one sans-serif, such as Arial. Several of the languages have over four styles to choose from.

With over 129 keyboards to choose from, you have a vast choice of available languages and means of keying in different characters, so you can pick the keyboard which is most natural for you

The handbook makes the process of typing in the right language, the right font and the right keyboard look much more difficult than it actually is. To change language, you just select the right one and choose a keyboard and preference font. The first time you use a language, remember to choose the appropriate keyboard for you, as some of the default keyboards are not ideal. If you want to type in Russian you need a Cyrillic keyboard, but if, as an English user, you want to type French, it makes more sense to use the extended United States International keyboard, which has all the accents you need, rather than the native French. In this way you can stay with the English qwerty keyboard, rather than having to change to the French azerty one.



Unitype is an add-on which can work with any application you choose. You can use as many different languages and typefaces as you like within one document

If you have ever tried to type in another European language, you will have realised quickly that it is virtually impossible to type accents properly without having to use the frustrating combination of Alt and a three-figure number. Apple came up with a neat solution for the Mac years ago, but such problems were obviously far too exotic for the PC market.

Some elements of Unitype betray the fact that this is a bit of a make-do-and-mend solution. You must remember to change the font in the application, as well as in Unitype, which can lead to confusion as everything you type comes out as gobbledygook. Email is claimed as one of its benefits, but again, the person you are mailing will have to have the right fonts installed for it to be successful.

In the version we saw there were no spellcheckers, which again limited its use. Maybe we are all just weak creatures, slavishly dependent on spellcheckers, but the lack of one really makes you question your linguistic abilities.

These limitations aside, this is an excellent little utility.

Adele Dyer

PCW Details

Gamma Unitype World
Price £99
Contact Lingua Language Services
01484 689494

Good Points Highly adaptable — can be added to a wide range of applications.
Bad Points Expensive if you want to add more languages and spellcheckers.
Conclusion Excellent.

HARDWARE

Aries Universa Multimedia Station

A low-priced, standard multimedia PC with plenty of home-use software.

The interesting thing about the Aries Universa Multimedia Station is the price. Most multimedia PCs still cost over £1,000, so one which costs just £799 (excluding VAT) is worth a look. Admittedly the £799 price point is for 8Mb RAM — I insisted on a 16Mb review machine and this adds £139 to the price. The Universa is also the first machine we've tested that uses AMD's 120MHz DX4 processor.

The case contained a tiny motherboard measuring just six by ten inches. In the other corner, just below the power supply, sits the 540Mb hard disk. To my surprise, the motherboard was identical to the one featured last month in our fake cache news story (*PCW* March '96, p18), a Terminator SMT486/5x86, which begged the question: did this board contain fake cache too? X-rays revealed that this was indeed the case. The next question was: did Watford Electronics know about it? They didn't, and were horrified. Nevertheless, this incident does underline how little testing a company such as Watford Electronics undertakes. To some extent you are at the mercy of the company's suppliers if you do buy from them.

Watford Electronics lost little time in rushing us a replacement, and a week later the second machine arrived, this time with a larger motherboard containing real cache chips. At the front of the board is a type 3 ZIF socket containing the AMD 120MHz processor, capable of taking a Pentium Overdrive chip. It has four ISA and three PCI slots and 16Mb of RAM. The RAM was arranged as two 8Mb SIMMs, leaving two spare banks for upgrades. One of the PCI slots was filled with a Videologic GrafixStar 300 64-bit graphics card and one of the ISA slots with a SoundBlaster 16 sound card.

The way the connectors are arranged on the motherboard makes for a rather untidy array of cables inside the machine. The connector for the parallel port blocks access to one of the PCI slots. I was pleased to see that the ports at the back of the case were all clearly labelled.

On our review machine, the graphics were configured for 800 x 600 x 256 colours at 60Hz. A machine at this price has to cut corners, and one of the places this shows is the monitor. It's nominally 14ins but the diagonal measurement is $12^{3}/_{4}$in. Once you've adjusted the image size, the available screensize is down to $12^{1}/_{2}$in, a little too cramped to comfortably use the monitor at 800 x 600 resolution. It's worth paying another £89 for the 15in monitor if you can afford it. The keyboard is a standard one, and there's no complaints about the SP500 shielded 30W speakers or the Excel three-button mouse.

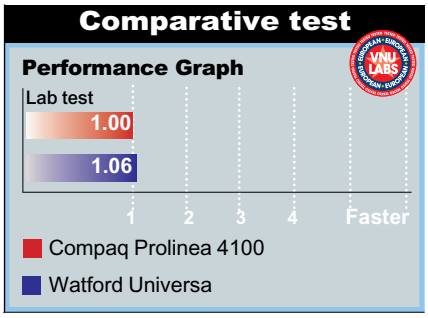
Watford Electronics supplied this machine with Windows 3.11. This means performance is snappy, but 3.11 is harder to use, less stable and worse on multimedia. It's a strange choice for a machine with a software bundle aimed at home users. Our suite of benchmarks now runs on Windows 95 so we upgraded the machine to run them. Windows 95 ran with no problems.

The final test for a package of this kind is the software bundle. You get plenty of it with the Aries Universa, but none of it is what I'd call mainstream. The Serif Page Plus and Serif Draw packages have good reputations for budget DTP, but the Novell PerfectWorks integrated package and the MoneyBox personal finance manager are not products you often come across. There's also a typing tutor, Typing Teacher, a selection of educational software (Junior essentials, Early essentials, Essential Maths and Structured Spelling, plus Learn German and Learn French). For an extra £19 Watford Electronics throws in a bundle of CD-ROM software including Infopedia, a multimedia encyclopedia, and Explorers of the New World.

The Aries has quite a good manual which arrives in a Filofax-style loose-leaf binder. In 50 pages it explains how to set up the PC, basic DOS commands and all the basic facts. The price includes a 12-month return to base warranty, but unless you live within easy reach of Watford Electronics' offices in Luton it's probably better to pay an extra £35 for on-site maintenance (or £118 for three years on-site). The machine's Doom score of 30fps was roughly comparable with a Pentium 75MHz. In the application tests it scored 1.06, marginally faster than our index machine, a Compaq Prolinea 4100 DX4.

Ben Tisdall

Comparative test



PCW Details

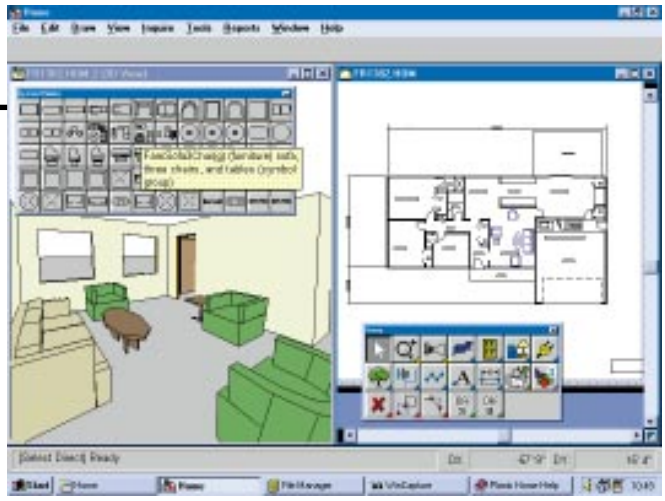
Aries Universa Multimedia Station
Price (as tested) £938
Contact Watford Electronics 01582 745555

Good Points Cheap. Plenty of software.
Bad Points Indifferent monitor. Windows 3.11.
Conclusion Built down to a price, but a reasonable budget buy none the less.

SOFTWARE

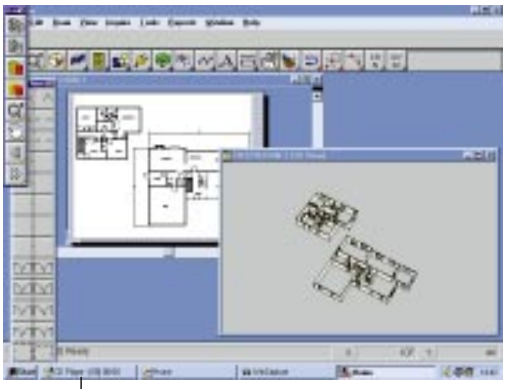
Planix 3D Home Designer

Don't redesign your home without this affordable, all-in house design package.



Right
Planix Home lets you look at several windows, either of different views or different drawings. Each window can display one, two, or four panes at a time.

Below
Start a new Planix Home drawing by picking a house outline closest to your own.



Planix Home's 3D view brings your 2D drawing to life, either from the viewpoint of someone who is standing in the house or from an elevated, bird's-eye position.

It is astonishing what you can get for the money these days. At under £50, Planix Home Designer offers sophisticated CAD (Computer Assisted Design) to the relatively impecunious home and small business user with a 386 and just 4Mb RAM. You can use it to create an accurate plan of your home, add fixtures, fittings and furnishings, change things as you go along, then print out hardcopy to scale. And having drawn your two-dimensional plan, you can view it in three dimensions, either from above or from a chosen position in any of the rooms.

Planix Home designer is actually two applications used in tandem, Planix Home and Planix Symbol Editor. You use Planix Home to draw the walls of your house, including doors and windows, and to view everything in 2D and 3D. It comes with a library of pre-drawn symbols for fittings and furniture. If the supplied symbols aren't enough for you, you add new ones from Symbol Editor, either based on an existing symbol or created from scratch. The only snag is that symbols created in Symbol Editor do not appear in the three-dimensional views.

Home Designer has all the usual CAD tools, including lines, arcs, curves (fitted and spline), polygons, three types of angle (standard, compass and bearings), circles and text. Home Designer can make use of layering techniques, colour and variable line-thickness. You can specify locations using XY or polar co-ordinates, which can be absolute or relative, and you can draw to accurate scale. If you're not a draughtsman, or it's all too much trouble, you can pick a basic house shape, change the dimensions to suit, and start adding doors, windows and internal walls straight away.

One useful feature is the use of drawing layers. Each time you add a symbol object, it is automatically assigned to one of 22 predefined layers. A refrigerator, for example, is assigned to the Appliance layer, a bed or sofa is assigned to the Furniture layer, and so on. This means you can remove or hide some layers for greater clarity in viewing the rest. You can also use colours to distinguish separate layers and lock individual layers to protect their contents from accidental change.

As well as scrolling or panning over larger drawings, you can split a drawing window into two or four areas displaying separately-controllable views of the same drawing. You can magnify the drawing by zooming in or reduce it by zooming out, and you can choose from a number of pre-set views or devise your own.

Planix Home Designer comes with an additional CD-ROM of 500 pre-drawn house plans, provided by a US home plan magazine publisher. This is great, as long as you can find one in there to match your own dream home (you can, of course, edit them). There are no accompanying illustrations however, either on paper or as thumbnail graphics, so you have to load all 500 plans serially to look at them.

Planix Home Designer is not, of course, the only program of its type. Other software lets you prepare accurate scale drawings using a full range of CAD tools. Other software uses symbol libraries to add pre-drawn furnishing detail. And yet other software lets you view your efforts in 3D. But you don't always get all these functions in one package, and especially not at this price.

James Taylor

PCW Details

Planix 3D Home Designer
Price £49 plus VAT
Contact Roderick Manhattan Group
0181 875 4444. Fax: 0181 875 4401

Good Points Comprehensive and versatile range of facilities. Low price
Bad Points G-Plan and MFI furniture designs only. No furnishings colour control.
Conclusion If you're planning to change your home, this is the software to use.

SOFTWARE

Primavera SureTrak 1.5

This could be the panacea for large-scale project management problems.

A cabinet maker's workshop is full of weird and wonderful tools, some specifically designed for a single task. Imagine now the desk of a professional project manager — would you expect them to use coarse implements or skilfully developed tools in their craft?

SureTrak's box promised handling of activities, resources, costs, revenues, critical path relationships, floating time and, most importantly, monitoring tools. All the things, in fact, that project managers could desire, and an exciting departure from the limited traditional perspective on project management software — that all it should be able to do is bash out a quick Gantt chart or three.

SureTrak initially seemed obstructive, starting new projects by taking me through an extensive help Wizard for creating Dictionaries. After consulting the manual and online tutorial, however, I began to get into the swing of things, building the activities to define the relationships for early start, late start, predecessors and successors, and to map the relationships on a time scale. It was finally producing my Gantt chart.

I found it useful for day-to-day projects: it made me question my timings and resource allocations. I started to realise when my bottlenecks were going to be and when my revenue was expected due against my costs. This was complete project management, accurate and informative: SureTrak 1.5 proved supremely competent.

SureTrak's main screen displays the list of activities and the time dependent display. Complex starts and durations can be set and graphically displayed (as Gantt charts). Each activity can be linked into those dictionary items, allowing multi-project tasks to be grouped person by person or department by department. This detail provides insight and allows aggregated analysis. A button on the start-up wizard asks if you want it displayed each time a project starts. The answer is a definite yes.

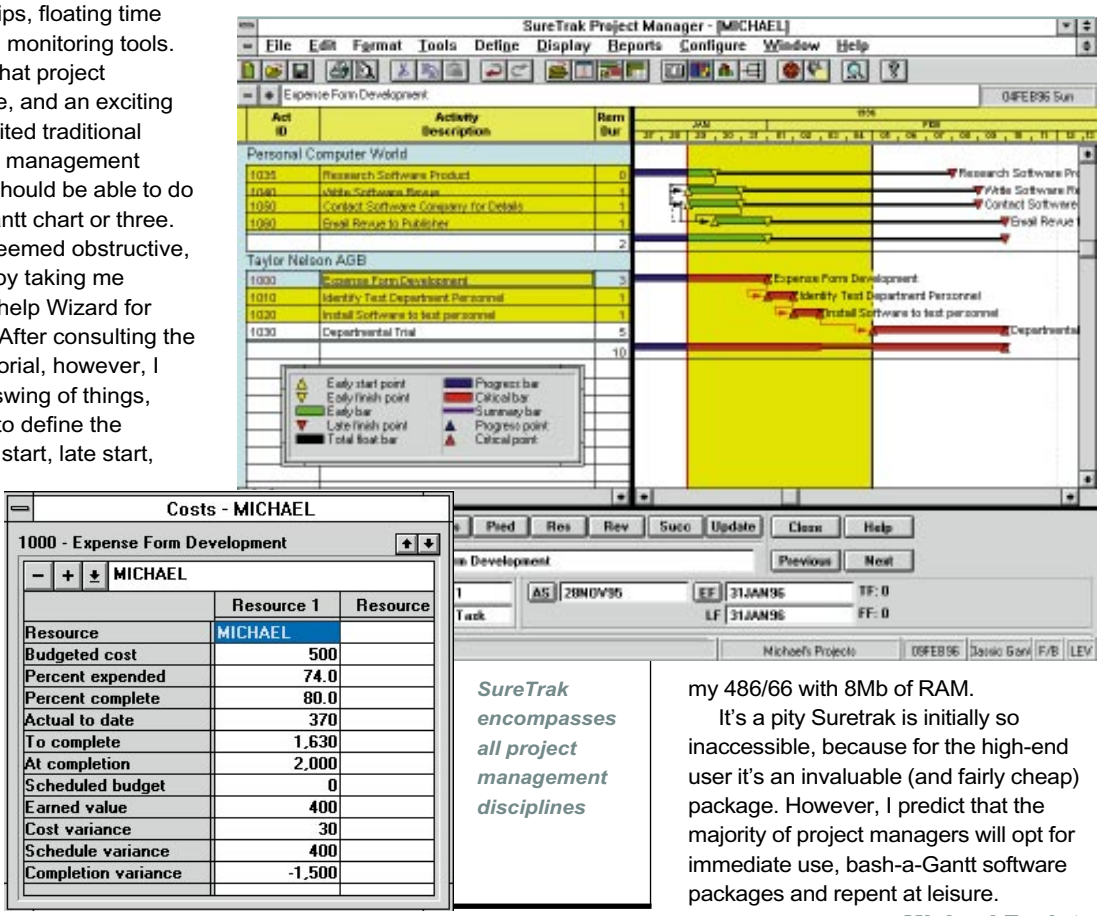
SureTrak's intelligence can "alter" your inputs when illogical, and it helps you to manage activities. It allows you to set activity revenues, percentage complete, days still to do, combining costs to date with completion to date, to estimate final balance calculations. It handles resource analysis and resource levelling, ensuring that no-one need work a 48-hour day. SureTrak can even identify specialised calendars and fiscal periods. The depth of the product when approached as a long-term aid is immense.

SureTrak enables team access even across different languages and additionally supports email to communicate user-specific aspects to those involved. Focus on projects, especially large or multiple ones, could be difficult, but with SureTrak's Spotlight, all your crucial activities can be bathed in yellow, allowing areas for attention to come easily to the eye.

SureTrak recommends a 386 with 8Mb of RAM, and at least 8Mb of space for installation; for multi-access it supports Novell, Banyan Vines, Microsoft and many other networks. It performed effortlessly on my 486/66 with 8Mb of RAM.

It's a pity Suretrak is initially so inaccessible, because for the high-end user it's an invaluable (and fairly cheap) package. However, I predict that the majority of project managers will opt for immediate use, bash-a-Gantt software packages and repent at leisure.

Michael Eagleton



SureTrak encompasses all project management disciplines

PCW Details

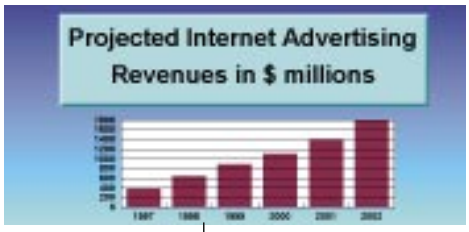
SureTrak 1.5 for Windows
Price £199 plus VAT (£69 plus VAT for upgrade from 1.0)
Contact Primavera Systems 0181 748 7300

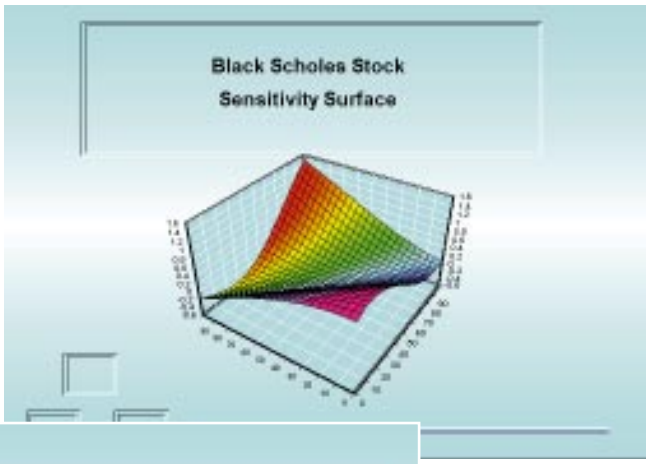
Good Points It does everything you could ever want, professionally.
Bad Points Project management within the hour unlikely.
Conclusion Encompasses *all* project management disciplines. A complete project management tool for windows.

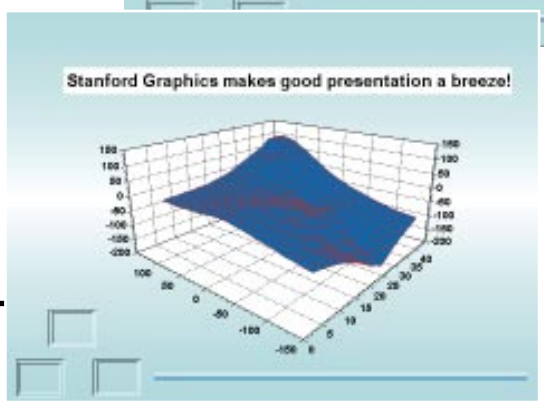
SOFTWARE

Stanford Graphics 3.0

Sophisticated and well-featured technical graphics and data analysis.





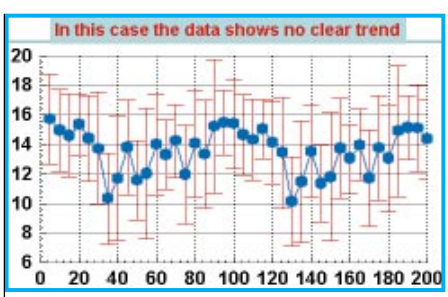


above. Stanford Graphics makes professional presentations a breeze right. It only takes an afternoon to produce impressive results with Stanford Graphics 3.0

Stanford Graphics has long been highly regarded as a sophisticated technical graphics and data analysis package, and with the release of version 3.0, the program has come of age. Running in Windows 95, this extensive product offers DDE and OLE linkage to other programs, along with drag and drop editing which goes as far as text rotation.

Formula visualisation, Fourier transformations, curve interpolation, time series data with "intelligent axes", contours and error-bar processing and customisable line styles come in a package with a spreadsheet and tips Wizard, offering change for £100. While the Windows NT version sets the workstation user back £495 for a single site licence, this Windows 95 version is available for a cool £99. With automatic click on slide styles, slide presentation and even a slide sorter, bullet chart templates and a range of style masters, it would be difficult to lick the features offered by this program.

The opening quickstart menu offers a choice between creating a presentation, creating a graph, creating a bullet chart and editing a presentation. This is a package which starts by asking what you want to do and how you intend to do it, before you open or import the data and start the spreadsheet functions. Skip this menu and the Open File New menu offers a choice between a new presentation and a new spreadsheet. Contrast this with other packages where you start by opening a spreadsheet file or defining a function and then go through the process of transferring data from one office application and another.



Stanford Graphics combines three maths plots with advanced presentation tools.

The graphs option prompts for a choice between Business, Statistical and Technical. In addition to the usual alternatives, the Business graph options include Hi-Lo-Close, Gantt Charts, bubble charts and pie bubble charts. This program illustrates each graph type with a miniature illustration to enable the user to visualise the finished product before adding the data. To create any chart, all that is necessary is to select the type and select the data; the rest is automatic with all features fully customisable and tips Wizards giving advice at every stage.

This program does not offer everything. Changing background colour can be somewhat problematical: following the instructions of selecting the slide and then the colour menu from formatting, often appears to have little effect. Spreadsheet data can be pasted from other applications, but column headings must be excluded if you just want to click on the entire column, as opposed to highlighting the data set.

While not the fastest program of its type, Stanford Graphics offers a range of functionality including 3D function plotting, and data can be imported in Excel and Lotus 1-2-3 format, but surprisingly for a Windows 95 product, data import in Excel 5 format is not supported. Users accustomed to Excel and PowerPoint in Microsoft Office will find they have plenty to unlearn before the advantages of Stanford Graphics become apparent.

Eric Adler

PCW Details

Stanford Graphics 3.0
Price Windows 95/Windows 3.1 version £99; Windows NT/DEC Alpha version £495
Contact Visual Numerics 01753 790600

Good Points Integrated graphics and data presentation features in a budget package.
Bad Points Not quite Microsoft Office 95.
Conclusion A broad range of functionality at a reasonable price, within its limitations.

SOFTWARE

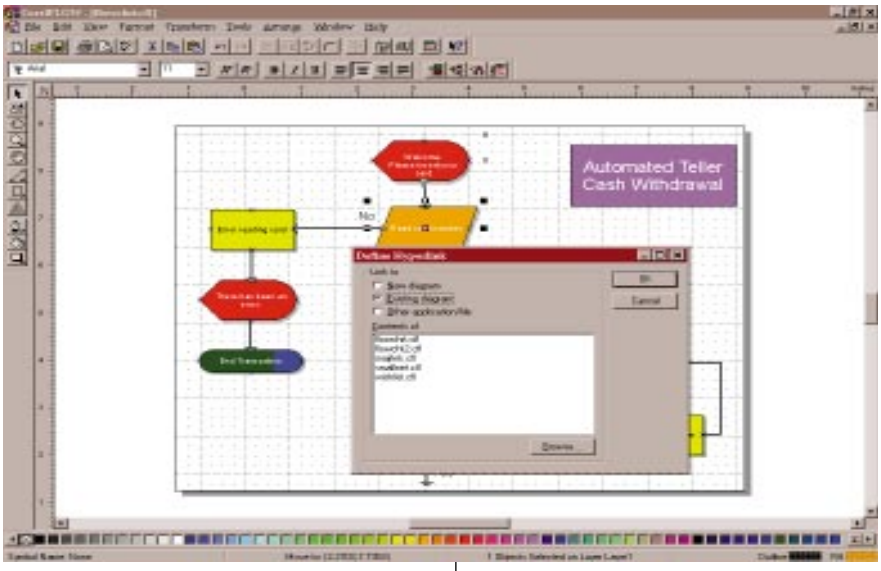
CorelFlow 3

The latest upgrade of this flowcharting package left us unmoved.

To accompany the 32-bit versions of CorelDraw there is an upgraded version of Corel's flowcharting package, and as with earlier versions it leans heavily on its sire. CorelFlow 3 is still essentially a custom version of the drawing package rather than a dedicated flowcharting program.

The artistic side of the software is well equipped, with 150 TrueType fonts, more clipart than you are ever likely to want to use in a flowchart, a spreadsheet and a thesaurus. Unfortunately, the manual has several hundred pages of clipart but only a couple of dozen pages on the features of the software — and none about actually using it.

The solution is to use the online tutorial. This gives you access to sounds, Corel's Internet pages and a very impressive demonstration of how a multi-level flowchart can be built. But to get the raw information about how to place a few boxes on a screen, line them up and print them out, is an uphill struggle.



CorelFLOW 3 — doesn't pull its weight

The truth is, CorelFlow isn't a very good flowcharting package. It may conform to all kinds of specifications for colour references, and of course it *is* possible to do flowcharting, but it doesn't do the hard work. The new version at least has automatic routing of lines between shapes, but this routing only avoids the other shapes. There is no attempt to limit the number of intersections between lines.

Shapes can contain text, but if you type

SOFTWARE

Internet To Go

Not the essential instant Internet kit.

What a good idea. Put everything you need to get connected to the Internet in one box and sell it as a complete solution. Great. I just wish someone would get it right.

Internet To Go from CyberTronics is the latest attempt. And they have certainly thrown a lot into the box: a (no brand) 28.8 fax/modem, CompuServe trial disks, UK Online trial disks, Pipex Dial trial disks, a CD-ROM of Internet utilities, and, er, trial disks for CityScape.

Internet To Go — stuck on amber

There's also a book and a video explaining in documentary style what the Internet is all about — dating from 1994. A long time ago, in Internet terms.

Where this product falls down is in its lack of integration. It seems the packagers have just trawled around, done some licensing deals with ISPs and thrown their disks in the box. The result is confusion for the new user. The only software that installs and works is the Pipex trial which logs on immediately, doesn't ask you for any credit card details and gives you a full 24 hours of freetime. More than enough to get to know the Net.

The video and book have been poorly chosen, too. The book's 600-odd pages are too hardcore to be read by the home market that Internet To Go is so clearly aimed at. It begins by introducing Unix shell commands — hardly "to go". A much better choice would have been the

too much text for a shape there is no scaling. What is needed is either for the box to get bigger or the font to get smaller. CorelFlow just hides the offending type. Shapes stay where you put them. The software doesn't try to lay the flowchart out neatly or to rearrange the shapes.

There are better dedicated packages.

Simon Rockman

PCW *Details*

CorelFlow 3
Price £149
Contact Channel Market Makers
01703 814142

Good Points Extensive features.
Bad Points Leaves the user to do all the work.
Conclusion Not a great solution.

excellent Rough Guide To The Net which *PCW* recently reviewed.

You do get a fast modem — granted. But for the same money you could buy a better branded modem, sign up to AOL and do everything that this package purports to make easy. The instructions for the modem are of little help to newcomers.

The market still needs a cool Internet-in-a-box product because, sadly, Internet To Go just isn't it.

PJ Fisher

PCW *Details*

Internet To Go
Price £199
Contact Cybertronics Technology
01626 202020 http://www.cdrom.co.uk

Good Points There's a lot in this box.
Bad Points Most of it you don't want.
Conclusion Good idea, flawed execution.

Long term test

PCW How You Can Contribute To The Long Term Tests Section

We welcome contributions from readers for our Long Term Tests section. If you've been using a piece of hardware or software intensively for some time, just write a 450-word article (for hardware) or a 750-word piece with screenshot — GIF format — for software and send it on disk, in MS Word (Mac or PC) or ASCII format, to: The Editor, Personal Computer World, VNU House, 32-34 Broadwick Street, London W1A 2HG. Mark your envelope clearly "Long Term Tests". We'll pay for any contributions we use.

HARDWARE

Epson Stylus 800 Plus

8 MONTHS TEST

Fine print quality from piezo technology leads to peace of mind with this printer.

MY FIRST PRINTER WAS A 300dpi Apple LaserWriter IIntx, which cost over £4,000 about eight years ago. Eight months ago, I bought a 360dpi Epson Stylus 800 Plus for £207 including VAT — that's *Vorsprung durch Technik* for you.

These days, my printing requirements are less demanding than they were, but as far as quality is concerned the Stylus 800 Plus is better. It fulfils two basic requirements: it prints sharp, solid blacks, and it is small, light and cheap.

Inkjets are renowned for their quiet operation, but that's if you're used to dot matrix, of course. Compared with some inkjet or laser printers, the Stylus is not really quiet at all; neither is it particularly fast.

Too good to be forgotten: the Epson Stylus 800 Plus

One of the Stylus range's strongest selling points is the piezo technology. This method avoids using heat to dispel ink, and it gives much better results. The print quality is superior to any 300dpi laser printer I've seen, or indeed any similar inkjet printer.

The printer is cheap, and running costs are kept low, too, by keeping the print head separate from the ink cartridge — unlike other inkjets, where the print head is contained within the ink refill. Epson scores again with innovative design. A cartridge tends to last me about 500 pages (mostly text with some graphics), which is handy because I always know roughly how much ink I've got by looking at how much paper remains in the packet.

Installation is an absolute cinch; so easy that I can't even remember doing it. A separate calibration program on the driver disk allows you to compensate for any misalignment after setup, but I didn't find this necessary. Accurate vertical alignment can be adjusted during printing by using the microfeed facility, which moves the paper forward or backward in increments of 1/180th of an inch.

Print resolution can be set at 180 or 360dpi and either speed or quality can be given priority by clicking on "High Speed" or "Microweave". If you choose Microweave at 360dpi, you'll find it hard to make out any rough edges at all; something which can't be said for the old LaserWriter.

The 800 Plus can't compete with a laser for speed and volume, but I was pleasantly surprised at the quality achievable with such a low-priced printer. As a designer, I paid particular attention to the comparative quality of other printers, both in reviews and on the street.

As I write this, a new range of Epson Stylus 720dpi inkjets is being launched, using the same permanent piezo print heads. The slogan for the last Epson Stylus range was: "Too good to cost so little". The new slogan is: "Life's too short to compromise". They were right then, and they could well be right now.

Marc Hindley

PCW Verdict

Slow, but gives good print quality and is cheap at the price.
Price Superseded by the Stylus 820; £219 (RRP)
Contact Epson 01442 61144

SOFTWARE

Borland C++ 4.5

1 YEAR TEST

Despite some initial tongue-twisting, this is the only programming language worth speaking.

A YEAR AGO I BECAME interested in programming in C++, having previously been addicted to programming with a ZX Spectrum. Having tried various shareware C compilers, I decided I needed a commercial product. C++ was the only language I thought worthwhile: Pascal was looking dated and Visual Basic rather slow.

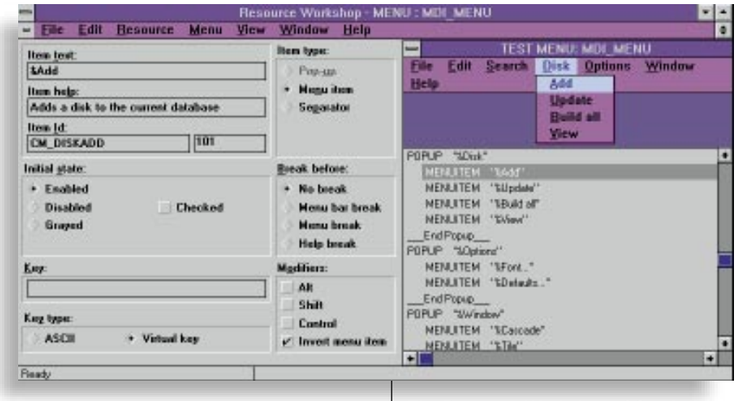
At the time, the cut-down version of Borland C++ (Turbo C++) was for DOS only. As I thought the death of DOS was imminent, I needed to learn some Windows programming at the same time.

My first experience with the product was not very pleasant. The install routine, a pretty little program with a nice background, is not as clever as its looks suggest. It became convinced that my 486SX was, in fact, not that at all but a 286, no less. Every so often it would give an error stating "386 or higher required to decompress…", and I would have to retry many times before it would work.

Once the program had been installed, I found it to be extremely impressive. The IDE (Integrated Development Environment) provides almost everything you could wish from a compiler, with helpful features such as syntax highlighting of code and customisation. It can compile DOS, Windows, and Win32 programs. It can even compile a DOS program so that it runs as if it were written for Windows, without any alterations to the code. The compiler is very fast, for DOS programs at least, and the executables produced can be optimised for either speed or size, or a combination, with specific optimisations selected via the IDE.

Compilation of Windows programs is somewhat different. The Borland ObjectWindows system, which encapsulates the Windows programming interface into C++ objects, is very effective and, once learned, easy to use. Unfortunately, the compilation of ObjectWindows programs really requires more than the 8Mb of RAM recommended on the box.

My 486SX ground to a halt when I tried to compile a "hello world" program, having been suffocated by the 60,000-plus lines of header it was forced to compile. I discovered later that this was because of a feature used in the example programs which compiles the entire set of header files used by ObjectWindows whether or not they are needed. This allows them to be stored on disk, and they never need to be compiled again.



The Resource Workshop of C++ brings time-saving editing to Windows programs

This is basically a code generation tool, which can write the code for most of the interface of a standard Windows program. Just tell it what you want the program to be like: MDI or SDI, whether you want a print preview, and even OLE 2 support. It then creates a fully-working program, with all the interface elements on which you can build the program functionality. This saves a vast amount of time as it can write hundreds of lines of bug-free code in a few seconds while you concentrate on the real work in hand.

Borland C++ has a number of time-saving tricks up its sleeve. One very useful tool is the Resource Workshop, a program run from the IDE which is used to edit any resources used by Windows programs (such as menus and dialogue boxes). Using this program, instead of having to type in the screen co-ordinates of a dialogue box, with all its buttons and other components, you just drag and stretch them about the screen until they are exactly where you want them. It then translates this into a resource script for use with your program.

Another extremely useful tool for Windows applications is the AppExpert.

One final thing to note is the documentation. The CD version is supplied with the manuals (all eight inches' worth of them) in both printed form and stored on the CD, using a program called DynaText. Although this is no substitute for the paper manuals when reading the tutorials and such like, it does help when searching for keywords and things not covered in the extensive online help.

Donald Sturgeon

PCW Verdict

A very fast DOS compiler, with stacks of tools and features to aid Windows programmers, but a fair few megabytes of RAM are required for serious use.
Price £349
Contact Borland 01734 320022

DESKTOP REVOLUTION

Windows DTP software for all skill levels and all budgets.

No industry has been turned on its head by the computer revolution the way publishing has. For some this has been a tragedy: the redundancy of traditional layout, typesetting and production techniques has had a shattering impact on a skilled workforce. For many, however, it has brought about empowerment comparable with the invention of printing itself. All this has happened in just over a decade. The pioneers, Ventura and PageMaker, are both still with us, though neither are with their original owners and both have been eclipsed in the professional market by Quark Xpress. There is also a growing band of budget applications — DTP for everyman — that make it cheaper and easier than ever to get into print.

Just because it's easier and the tools are available to all, doesn't mean that no skill is required. I have in front of me a newsletter from a senior executive in a well-known graphics software company that contains so many elementary layout and typesetting errors that it would make an excellent "How not to…" tutorial. The important decisions in choosing a DTP package are first to take an honest look at your own capabilities and willingness to learn. Do you want to devote time and effort to mastering the niceties of typography, and the interface of a complex piece of software, or do you want something that does it all for you? Secondly, take a hard look at what you want to do with it — black and white school newsletter or glossy lifestyle magazine? Business stationery or books? The diversity of DTP software on offer is astounding — there are packages here for all skill levels, and with price ratios over twenty-fold, for all budgets as well.

This time, we've drawn the line at DOS-based applications. Although several of these products are available on other platforms, it's Windows all the way, and unless otherwise stated, the products run on both 3.1 and 95.

Gordon Laing

DTP SOFWARE CONTENTS

PCW **DTP lino style** Illustration by Melvyn *Evans*

Adobe PageMaker 6

PageMaker is synonymous with desktop publishing; indeed, the term desktop publishing was coined by none other than Paul Brainerd, president and founder of the late Aldus. About two years ago, graphics giants and long-time rivals Adobe and Aldus lowered their swords and merged to become... Adobe.

Adobe didn't previously possess a layout package, so the company happily took on PageMaker as part of its product line-up. PageMaker 6 is the first new version under the Adobe wing, and using it is like meeting up with an old friend. That's good *and* bad news for Adobe and PageMaker in general, however. Good, since there's a huge number of designers who learnt DTP on PageMaker, and remember fondly how it operates. Bad, since virtually the same number of users voluntarily migrated *en-masse* to Quark XPress 3.1 when PageMaker 4 could no longer compete.

The trouble was that XPress 3.1 simply beat PageMaker 4 on every count, including built-in colour separations, superior typographical control, and, to be honest, better control all-round with its many palettes and advanced features. You want an example? Until version 5, PageMaker couldn't even rotate in less than 90 degree increments, or automate the drop capital process.

With PageMaker 5, Aldus decided to "borrow" a few of the things that made XPress 3.1 so great. All of a sudden, there were colour separations, control and library palettes, free rotation, and its own versions of Quark XTensions, imaginatively named Aldus Additions. Several were included with PageMaker 5, including one to create drop capitals.

To fit in with the Adobe product range, Aldus Additions have been renamed Adobe Plug-ins, but they're the same scripts as before. PageMaker 6 can use Photoshop-compatible Plug-ins, but these only work on TIFF files and are accessed from a different menu.

PageMaker 6 has multiple master pages and HTML support

Interestingly, Adobe has provided a Scripts palette which provides a fascinating insight into how the program operates. We already know the Plug-ins are scripts, but the palette reveals the various magnifying views, auto-leading, trapping and printing facilities among many others to be scripts as well.

Jumping on the Internet bandwagon, Adobe has supplied an HTML Plug-in. HTML (HyperText Markup Language) is the system used for creating pages with links and anchors for the World Wide Web. Web or online publishing is certainly one way forward, and Adobe wants its foot in the door early. However, few of the HTML publishing packages do the job that well, PageMaker included, and many Web programmers are sticking to typing HTML code directly into WordPad with a reference book handy. Incidentally, there is an HTML XTension for Quark XPress, costing £50.

The Scripts pallette reveals how many PageMaker functions work

On the plus side, Adobe has finally given PageMaker 6 the facility to create multiple master pages, something XPress has had for ages and which is essential to professional DTP. PageMaker's print dialogue box is still miles ahead of any other we have seen.

Like XPress, PageMaker 6 isn't targeted at the beginner: it's expensive, and it's not supplied with any Wizards or templates. Being an Adobe package, however, it does come on a deluxe CD with previews of other Adobe products, and the Type-on-call font CD is thrown in too, with a load of unlocked faces when you register.

But the question is: who is going to buy PageMaker 6? Adobe is clearly desperate to have lots of registered users, offering upgrades from *any* earlier version for the unmissable price of £99. Current XPress users have no reason to swap to PageMaker 6, while those wanting to enter the high-end DTP market are still best off going for XPress.

Adobe has done a good job of PageMaker 6, but despite it being an excellent product, XPress is better still, supported by almost everyone and virtually the industry standard. PageMaker 6 may be a bit cheaper but it's no budget package, and can only be recommended to those upgrading from an earlier version.

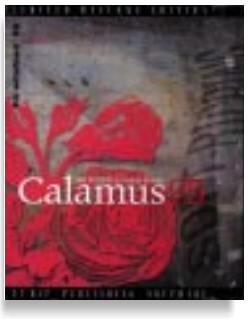
Gordon Laing

PCW Details

PageMaker 6

Price Upgrade from any version £99. Street price £440
Contact Adobe 0181 606 4000
Adobe Direct 0131 451 6888

Good Points Offers excellent high-end DTP facilities.
Bad Points XPress already has that market sewn up.
Conclusion Only recommended for the current PageMaker die-hards.



Calamus 95

Calamus, which originates from Germany, enjoyed a period of popularity on the Atari ST and then seemed to fade away. Now it's back — with a mission to win the hearts and minds of PC users. The CD-based Limited Welcome Edition will copy over 150Mb to your hard disk if you let it, but I was able to reduce this to a more reasonable 23Mb by forgoing the bitmaps, clipart and sample files. This is a true 32-bit application and requires Windows 95 or NT.

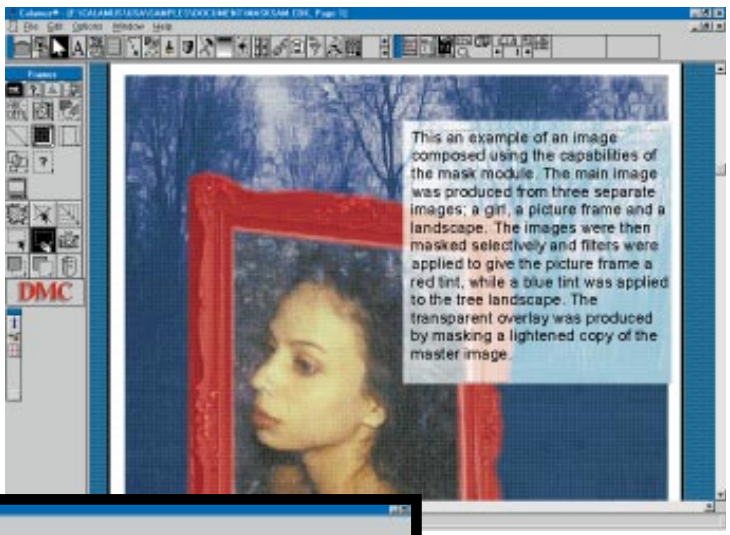
My initial reaction was one of total bewilderment — a hyperactive and confusing display of unfamiliar buttons and controls was not helped by a slim manual written in German. There are, however, 23 help files containing nearly 7Mb of information, tooltips and a context-sensitive help panel. No templates were provided, however, which seems rather an oversight.

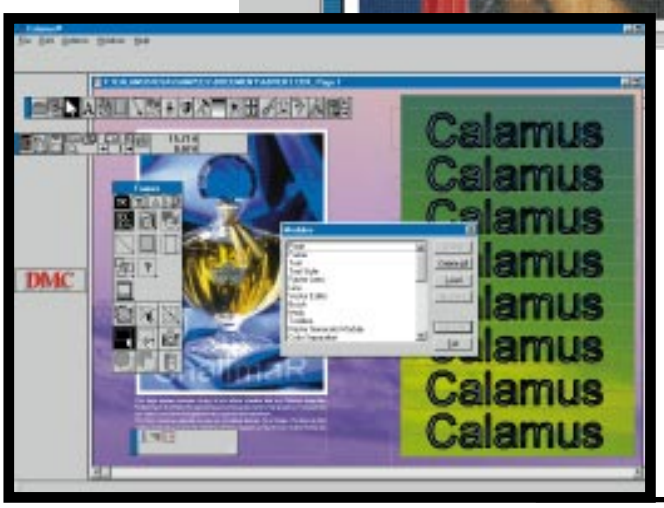
Calamus features a modular architecture: each module addresses a specific function such as scanning or vector drawing, and modules can be loaded and unloaded as you need them. Since Windows already caters for this using DLLs and OLE servers, this might seem like an exercise in wheel-reinvention. However, with the default modules loaded on a 16Mb PC Calamus seemed extraordinarily memory-hungry, so unloading a few unused modules might be a good idea.

The modules themselves are accessed from a button bar, the Module Row, at the top of the screen. To the right of this a second bar, the Toolbar, contains buttons for zooming and page navigation, together with a cursor co-ordinate read-out. Both bars can be dragged to "float", but unlike most applications the work area doesn't resize to take advantage of the extra space — you're just left with an empty grey band below the menus.

To the left of the screen is the Command Group for the currently selected module. Some modules have more than one Command Group, and these are paged using the tabs at the top. Some groups are divided into conventional Windows-sculpted buttons, some consist of icons on a flat, undivided background. Some mix the two. Below the Command Group (though it can be moved elsewhere) is the Iconbar. This, to quote the help file, is "similar to the Module Row" and "contains icons for modules that are not contained in the Module Row."

It's hard to find a Windows convention that isn't flouted. To create a frame or shape in practically any Windows application, you press down the mouse button, drag, then release the button. With Calamus, you have to end with an extra click. Double clicking on the title bar of a MDI child window usually maximises it, but here you get a "Document Information" box. With almost all Windows applications, access to fonts is automatic — but not here. You have to load TrueType and Calamus "own-brand" fonts individually for each document.





Above *Calamus 95: stunning visuals, but a staggering interface*

Left *Calamus lets you load just the modules you need*

This is undoubtably a very powerful package, with full colour library and separation, advanced screening up to 750dpi, vector and bitmap graphic tools and much more. The sample files show some impressive masking and transparency capabilities for use with images. In its present state, however, the average Windows user will need to devote a lot of time and effort getting to grips with it.

Tim Nott

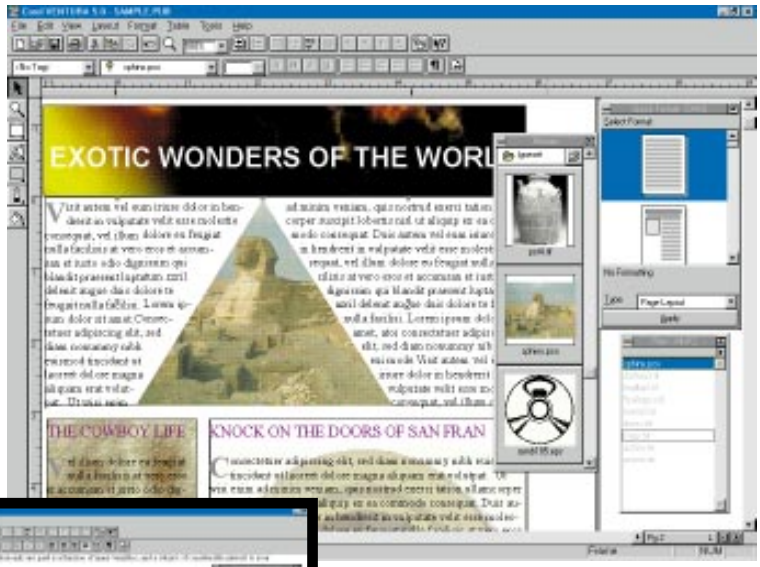
PCW Details

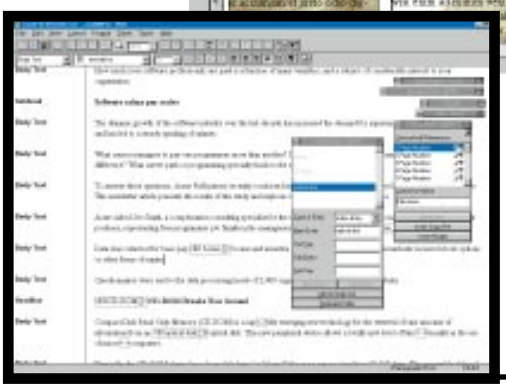
Calamus 95
Price £149 (inc. VAT)
Contact Jaks Graphic Design & Print 0114 248 3420

Good Points Powerful, modular and like no other Windows DTP application.
Bad Points Complex and unfamiliar interface, with a Matterhorn of a learning curve.
Conclusion Only for those who enjoy a challenge.

Corel Ventura 5

Another DTP pioneer, Ventura Publisher first appeared for the PC under the GEM interface but was rather eclipsed by the advent of the PageMaker/Windows combination. Although a Windows version did eventually appear, it wasn't until the Corel Corporation acquired Ventura that it started to make a comeback. Corel is not known for doing things by halves, and the CD-ROM edition of Ventura contains no less than three CDs. Disk one, in addition to Ventura itself, contains Corel Photopaint (image processing), Mosaic (picture library management), Kern (kerning table editor), Query (database extraction), Database Editor (for Paradox databases), an introductory version of Fontminder, Xandar TagWrite (conversion of "marked up" documents), Adobe Acrobat Reader (for cross-platform "portable" documents), screen capture and equation-editing utilities, nearly 700 TrueType fonts and 17,000 pieces of clipart. Disk two adds the fonts in Adobe Type One format, a working model of CorelDraw, a multimedia showcase of other Corel products, a multimedia tutorial and ten more languages for spelling and hyphenation. The final "sampler" disk adds a selection of high-quality photographic images. Despite all this, a minimal install, running most of the programs from CD, takes just 6Mb and the full whack (excluding fonts and clipart) 36Mb. You'll need at least 8Mb of RAM; 16Mb is recommended.





Above *Ventura in action, with roll-ups open for adding pictures and formatting. Note the exotic texture fills*

Left *Adding index entries and cross references in Ventura's Copy Editor. Note the Quick Format and other palettes "rolled-up" out of the way*

Although nothing like as hand-holding as Microsoft Publisher, PagePlus or Pressworks, the interface has been much improved from version 4.2 and has a similar look and feel to CorelDraw. Two toolbars at the top of the screen provide file, clipboard, view and formatting controls, while a small toolbox on the left provides the page layout tools, line and fill buttons which "fly out" to offer further options. Roll-ups are available for such things as the Quick Format palette and the Mosaic picture manager. These look like conventional dialogue boxes, but can be kept open all the time or collapsed into their own title bars to keep them out of the way.

Text-handling now includes a Copy Editor that works in much the same way as PageMaker's Story Editor, and there is a range of "smart" word processing enhancements such as automatic capitalisation, smart quotes and auto-replacement of common mistakes or abbreviations.

In the early days of DTP, Ventura was considered to be suited to long technical documents, whereas PageMaker was more design-orientated. Ventura still boasts many long-document features, such as tagging, organising chapters into books, and the facility to manage many independent text and graphic files. Since the Corel takeover, however, its graphic design capabilities have seen an upswing. You get drawing tools, bezier editing, free text rotation and text-wrap. Most spectacular of all is the range of Corel-style fills, with numerous options for graduated tints, patterns and beautifully textured, fractal-generated backgrounds.

Should you lose your way around the 700 typefaces, Panose font-mapping suggests substitutes for missing fonts when a publication is opened.

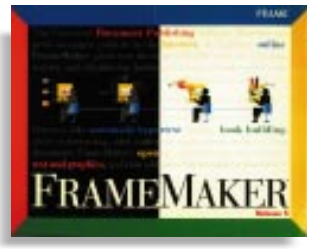
In terms of colour, there is everything the serious DTP-er could wish for. Before you start to produce documents, you can use the Colour Manager to create a "Profile" for your system, calibrating it so that scanner input, screen display and final output match colours as closely as possible. There is support for several colour libraries, including Focoltone, Trumatch and Pantone, and Ventura will produce process and spot colour separations with automatic trapping.

Tim Nott

PCW Details

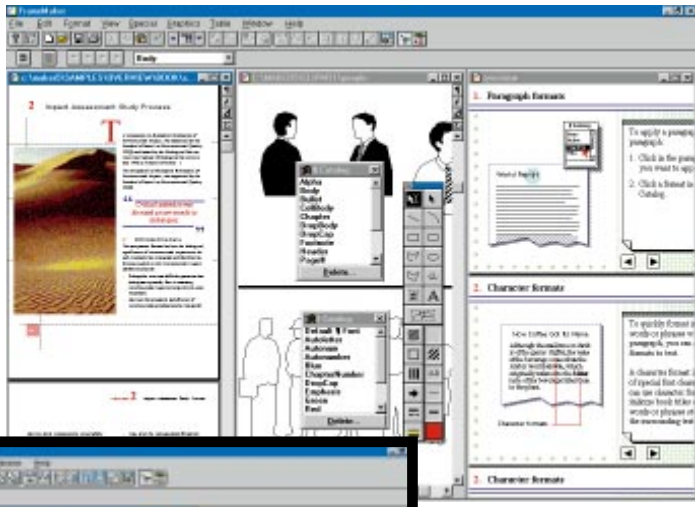
Corel Ventura 5
Price £349 (CD-ROM), £394 (disk)
Contact Channel Market Makers 01703 814142

Good Points A highly competent application with an astonishing wealth of resources.
Bad Points Its complexity could put off the inexperienced.
Conclusion Serious DTP value for those prepared to learn.

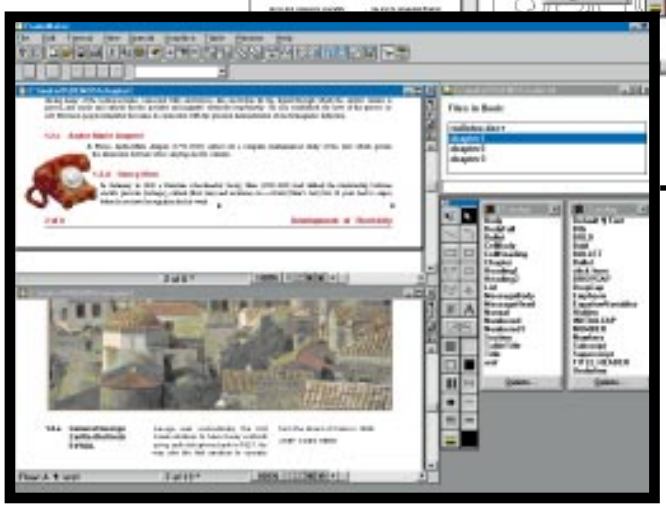


FrameMaker 5

The past year saw something of a shopping spree for Adobe, who acquired not only PageMaker but also FrameMaker, another top-level DTP application. FrameMaker has always existed rather off the beaten track of high-end DTP — it calls itself a "Document" rather than a "Desktop" publisher. It's available on Mac and Unix platforms as well as the PC, and pioneered the concept of cross-platform electronic documents long before Adobe's Acrobat came on the scene. You'll need 8Mb (12Mb recommended) of RAM, and 10-30Mb of disk space.



Left *FrameMaker's multiple document capabilities let you have your document, clipart, and a help file on screen together*



Below *Getting organised in FrameMaker, with lists of chapters, character and paragraph styles*

With its electronic document credentials, FrameMaker has always eschewed the standard Windows Help system in favour of a comprehensive collection of documentation in its own hypertext format, together with a series of tutorials to guide you through this complex and idiosyncratic application. There is also a generous selection of samples and templates. A copy of Adobe Type Manager and the basic 13 fonts are included, and there's a 750-piece clipart collection also in the form of FrameMaker documents. You can open multiple documents, and whereas the main window has a customisable toolbar and formatting ribbon, each document window has its own controls for zooming and navigation as well as a set of buttons to open and close the drawing tools, equation-editing and style "catalogues". The multiple document interface means you can have one or more help files open as you work on your own document. Alternatively, you can view these as standalone FrameMaker hypertext documents.

By modern standards the interface is rather dated — there are no Tooltips or status line hints. Should you want to change font, for example, you have to go via the menus. If you're properly organised, however, it's quicker to use the style catalogues to assign font and formatting attributes on a character or paragraph level. Page layout has been made easier in this version — it's now much simpler to use multiple columns with headlines that straddle more than one column, and add sidebars and pull quotes. Irregular text-wraps are included: previously this involved the tedious process of breaking text into single-line frames and adjusting each one. Colour support includes Pantone and separations, though trapping has to be done manually.

The area where FrameMaker really concentrates its power is on long, complex documents, with automatic creation (and updating) of indexes and contents tables, and "conditional" text and graphics. This last enables a single document to exist in various versions. Say, for example, your company produces three versions of a television — the basic model, one with Teletext, and one with Teletext and stereo sound. In the user's manual, the common functions will be in normal text, but those sections that refer to Teletext and stereo can be flagged as conditional. Consequently, the conditional text and graphics can be turned on and off to produce three versions of the same manual. You can organise individual documents as chapters of a book, and open one or more chapters while keeping a contents list open on the screen as well.

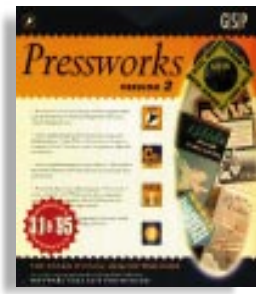
The existing hypertext facilities — jumping to another page or document and offering the reader pop-up menu choices — have been leveraged in keeping with the times. An HTML converter is included to prepare Internet Web pages and an enhanced PostScript generator will produce files that can be imported into Acrobat Distiller.

Tim Nott

PCW Details

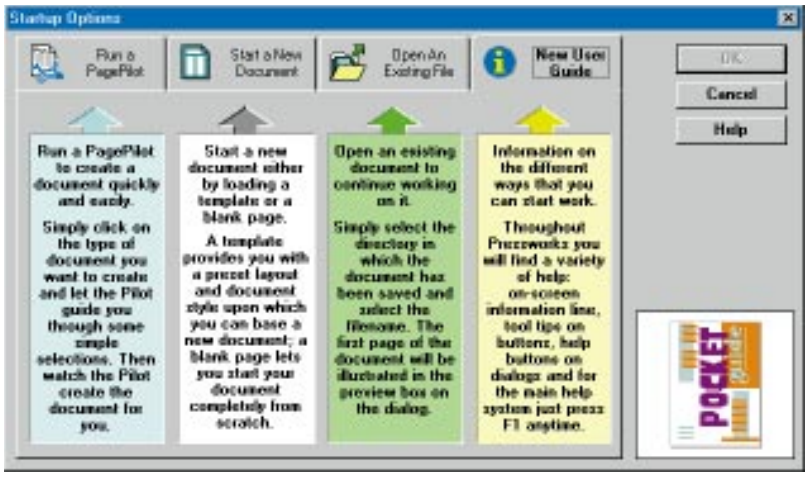
FrameMaker 5
Price £695
Contact Frame Technology
0181 606 4100

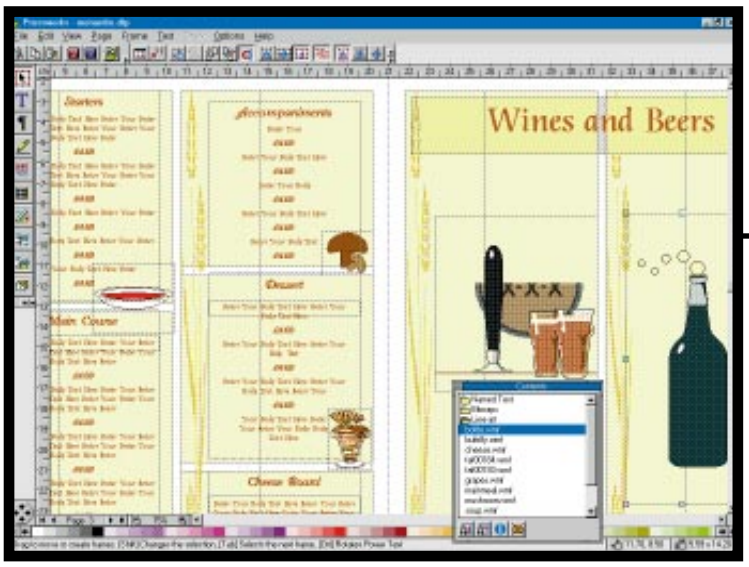
Good Points Cross-platform support, hypertext, and complex document management.
Bad Points Awkward interface sacrifices Windows conventions for cross-platform integration.
Conclusion A niche product for document management in the corporate environment.



GSP Pressworks 2.02

No, we haven't made a misprint, and yes, this is from the same people who brought you 1st Press and Timeworks — the UK outfit has swapped the T for a P to avoid confusion with the US company. Other changes from our last review include a substantial drop in price and both CD-ROM and floppy media in the same box. French and German versions are included on the CD. You'll need up to 27Mb of disk space, unless you want to run Pressworks straight from the CD, and at least 4Mb of RAM — 8Mb is recommended. Though the box carries a sticker saying "Windows 3.1 & 95 approved", this is strictly a 16-bit application and doesn't support Windows 95 enhancements such as long file names or enhanced Save/Open dialogues. Extras include 100 clip-art files, an image browser, 35 TrueType fonts with a manager, PowerText for special text effects, a symbol map, a Photo-CD browser (but no photos) and a screen-grabber. If you want more, the Powerpack upgrade adds 100 fonts, 600 pieces of clip-art and a spreadsheet-style table editor.





Above *Getting started the easy way with GSP Pressworks.*

Left *GSP Pressworks — straightforward interface, good colour and a useful list of a publication's*

The opening screen offers the usual options of using a template or starting from scratch, plus that of using a "PagePilot". Working in a similar way to Microsoft's Wizards you start by choosing the type of publication — book, newsletter, brochure — then follow a series of multiple-choice questions to select the layout and main titles. The publication is constructed using dummy text which you replace with your own. "Cue cards", short, context-sensitive help panels, help with this.

If you want to create your own design, the first thing to learn is that everything is frame-based — text, pictures and drawing objects need to have a container created for them first. Having created a frame, select a mode — text, paragraph formatting, drawing, PowerText, clip-art or OLE and the top toolbar changes accordingly. Down below the mode buttons is a "nudge" control which will move the selected frame and its contents by a predefined amount. A right-click on a frame brings up a context menu from which you can resize and place a frame to exact specifications. Text will wrap around graphics automatically, and text frames need not be rectangular.

If you import text from a file, you have the option of placing it straight into a frame or parking it in the Contents Box — an extremely useful window listing all the text and graphics files in the publication. Select a frame, click on the file name, and the text will flow into the frame. If the text is too large, click on subsequent frames until the whole "story" is placed. There's an Autoflow feature that will do this for you, but it's rather poorly implemented. There seems no way of linking and unlinking frames at "master page" level, so the text will simply fill up all available frames, including those you might have intended for headings or sidebars.

For an entry-priced package, the colour support is impressive. Spot and process colour separations can be made, and there are four Pantone colour libraries included. It will import most standard graphic and word-processing formats, as well as text "tagged" in its own mark-up language. Though the online help is excellent for beginners, more ambitious users may find both this and the slim manual rather sketchy.

Tim Nott

PCW Details

GSP Pressworks 2.02
Price £39.95 (inc. VAT), Powerpack £29.95 (inc VAT)
Contact GSP 01480 496575

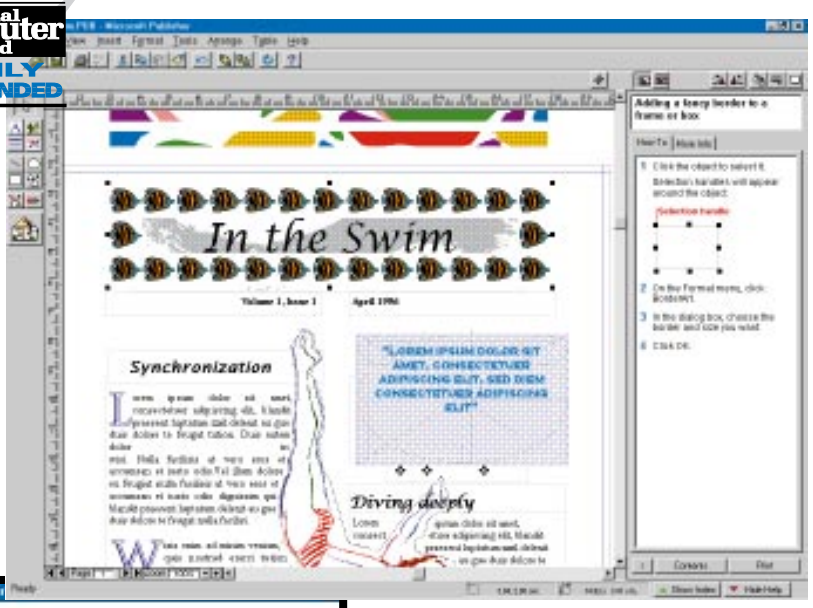
Good Points Simple and inexpensive, with good colour support.
Bad Points Awkward text flow and less-than-comprehensive documentation.
Conclusion Great value for money.

Microsoft Publisher 3.0

Personal Computer World HIGHLY COMMENDED

This latest version of Microsoft's easy-as-pie DTP offering is a full 32-bit, Windows 95 or NT-only application. You'll need at least 6Mb of RAM (12Mb on NT) and between 6Mb and 32Mb of disk space.

The successful design philosophy of "keep it simple — keep it easy" prevails, and the first thing you'll see is an introductory tour. Having assimilated this, you have the option of creating a new publication; either with a blank sheet or by letting a PageWizard guide you through one of 100 interactive templates arranged into 16 categories, ranging from newsletters to paper airplanes. Choose a Wizard and you'll be prompted through various decisions such as the style, title and number of pages in your publication. When the Wizard has done its work, you're not left on your own — step-by-step instruction bubbles help you replace the dummy text and graphics with your own, and a broader-based help panel sits alongside your publication. The latter, and also the help index, can be turned off and on from a button, and the work area automatically resizes itself to suit.



Above *Microsoft Publisher: loads of fancy effects with plenty of help on hand*

Left *One of Publisher's many demos help you through the maze of preparing your work for outside printing*

As you would expect, Publisher is "Office compatible", sharing not just a similar interface with products such as Word and Excel but also functional items such as OLE applets, the spellchecker and thesaurus. The interface itself is simple, a row of buttons below the menus offers saving, printing, clipboard operations and the stacking and rotating of objects. Below these is a context-sensitive row of buttons that change from word-processing tools to line and fill options, depending on what you are doing.

To the left of the screen is the main toolbox. You can create framed or free text, WordArt effects, tables, lines, circles and boxes, plus a whole range of "smart" shapes such as stars, arrows and 3D boxes. There are buttons to insert pictures and OLE objects, but the best fun to be had is with the Page Wizard and Design Gallery buttons. The former work like the Page Wizard templates but within an existing publication, so you can add advertisements, logos, coupons and calendars to your work.

The Design Gallery offers ready-made page elements such as headlines, sidebars, ornaments and contents panels. The Format menu contains decorative effects here too, such as "Fancy First Letters" and a range of border art for decorative framing. You can wrap text around graphics and rotate shapes, frames and blocks of text to any angle. Grouping objects so that you can move or change them in one go has also been made much easier, and as before you can create tiled posters up to six metres square.

Although there is nothing like the colour and pre-press support seen in the heavyweights or Pressworks, Calamus and the Windows 3.1 version of PagePlus, Publisher has grown up in some respects: there's now far more support for outside printing (together with a lot of good advice on choosing and instructing a printing firm) and up to two spot colours can be incorporated.

For those who want to go further than the supplied Wizards and templates, the printed Publisher Companion offers 250 pages of sound advice on the principles and practice of page design and typography.

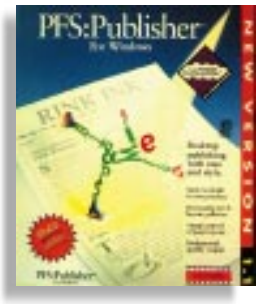
Tim Nott

PCW Details

Microsoft Publisher 3.0

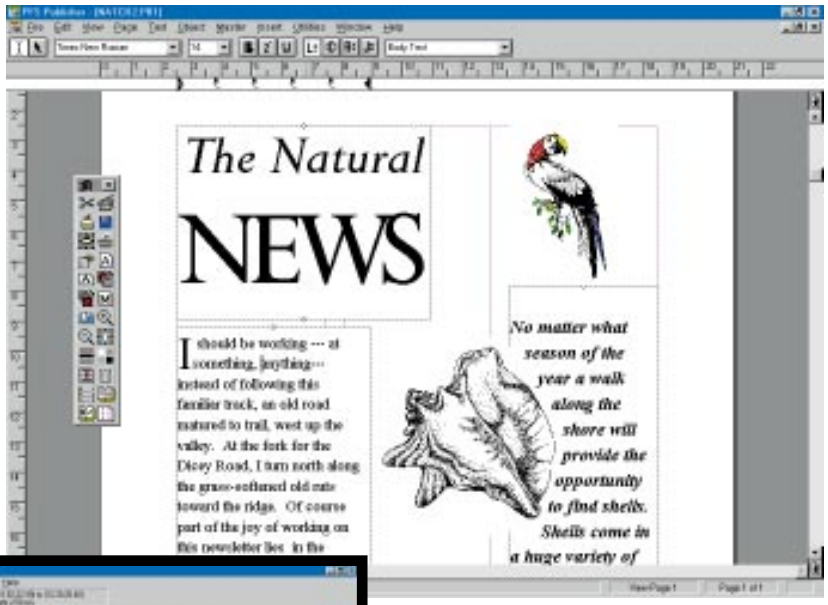
Price £70 (street)
Contact Microsoft 01734 270000

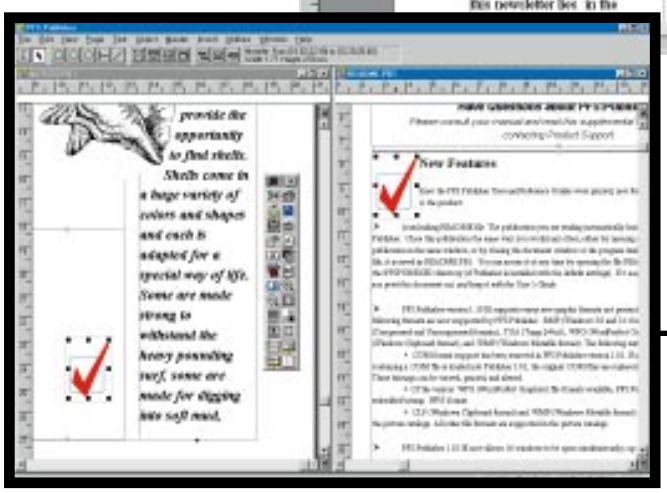
Good Points Excellent interface, extremely user friendly, and full of bright ideas.
Bad Points Lacks the "Pro" capabilities of some of the other budget applications.
Conclusion An excellent choice for those who want quality output instantly.



PFS:Publisher 1.1

PFS: Publisher hasn't changed since our last round-up. In fact, it hasn't changed since August 1993. In some ways, this can be seen as a plus point — the full three-floppy installation takes only 6.5Mb of disk space and it will run on a 286 with 2Mb of RAM (though 4Mb is recommended), making it ideal for schools, parishes or charities with tiny budgets and a reliance on elderly or donated PCs. As you might expect, there's not much in the way of extras. You do, however, get a small clipart collection and a clipart library utility. Twelve good-quality TrueType fonts are included, but beware — the installation routine copies these, wrongly, to the main Windows directory, so you need to re-install them manually from the Control Panel.





Above *PFS:Publisher — it's old, with very limited colour, but it runs on low-spec PCs*

Left *Despite its modest requirements, PFS is the only budget application to offer a multiple document interface*

The investment in learning time is minimal. Select a template from a list (previews are available) and you're in the publishing business. The interface is refreshingly simple — it uses just a single row of buttons. The two on the left provide the key: the arrow button puts you in Object mode, changing the rest of the bar to a set of drawing and frame creation tools, and the I-beam button summons Text mode with a word-processor style set of text-formatting tools. The right mouse button serves to toggle between modes. You can also have a customisable free-floating palette of buttons containing shortcuts to a range of 24 menu commands.

Despite the small footprint, PFS: Publisher is competently equipped. Master pages let you define objects, such as text frames, that will be the same for each page. Frames can be linked, so a "story" can be flowed over several columns or pages, but you have to do this manually, which is rather irksome for long documents.

There are table of contents and index generators, and unusually for a budget package you can load more than one document at a time. As with all the packages here, there's a spellchecker and a thesaurus, but PFS lacks a word count.

Graphically and typographically it's adequate. You can create drop capitals and incorporate these into a paragraph style — flow text around irregular-shaped graphics and control letter-spacing. Text remains resolutely horizontal: you can rotate *some* imported pictures but not text or drawing objects created in the program, and there is no type-tweaking special effects utility like Microsoft's WordArt or GSP's PowerText.

The PFS world is a monochrome one. You can tint frames and drawing objects in eight shades of grey and place white text over them, but that's it. You can, however, import coloured graphics as files or OLE objects from other applications. The supplied clipart is nearly all monochrome however, and as it's in bitmapped rather than vector format, scales poorly. There's a well-written manual, and though PFS lacks modern-day comforts such as ToolTips, Wizards and Cue Cards, the online help is adequate and the status line gives a description of each button and menu entry.

Last time we looked at PFS:Publisher there were reservations about its stability. Under Windows 95 it seemed far more robust, which is either a credit to the Microsoft Windows 95 team or to the prescience of the PFS programmers.

Tim Nott

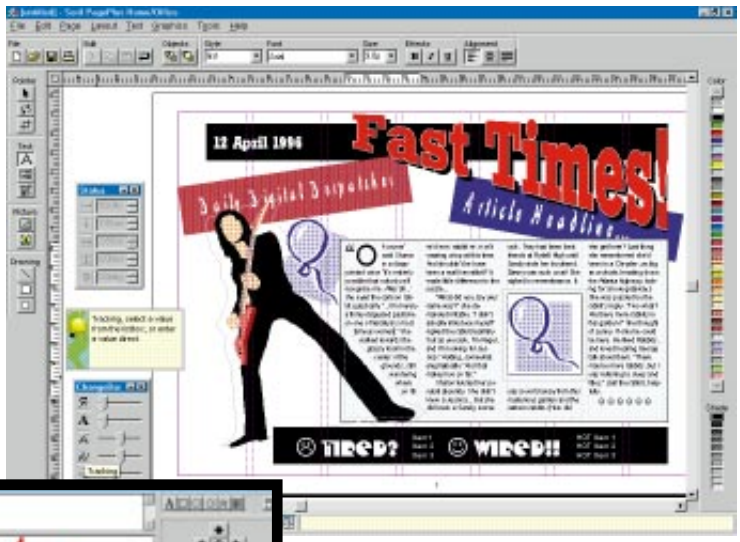
PCW Details

PFS:Publisher 1.1
Price £39.95 (inc VAT)
Contact Softkey 0181 789 2000

Good Points Simple to use and undemanding on hardware.
Bad Points Monochrome only and getting past its "best before" date.
Conclusion Useful for those on a shoestring hardware budget, but otherwise uncompetitive.

Serif PagePlus

HOME/OFFICE EDITION



Above *PagePlus Home/Office for Windows 95 sports a more conventional — and easier — interface*

Left *Serif's LogoPlus in the Home/Office Edition goes much further than the other type-tweaking utilities*

The PagePlus Home/Office Edition is strictly Windows 95. Installation from the CD-ROM can take as little as 5Mb or as much as 95Mb, with the recommended option taking 17Mb. Included on the CD are 100 TrueType fonts, 1000 pieces of clipart, 50 PhotoCD images, an Adobe Acrobat viewer with an electronic version of the printed manual, and some multimedia demos. The Windows 95 approval logo and the blue sky/white clouds packaging provide a strong feeling of déjà-vu, and the introduction of 100 Page Wizards leave no doubt as to whose market is under attack. Opt for a Page Wizard and the first choice is between Home or Office. The former includes greetings cards, resumés and CD liners, the latter the more conventional DTP offerings of business stationery, brochures and newsletters.

The interface sees some notable changes. The tools have been moved to a conventional left-of-screen fixed bar, and a context-sensitive button bar appears along the top. When text is selected, for example, this takes on the appearance of a word processor. With a picture selected you get layering, wrap and mirror controls. Curiously, you don't get controls for line thickness and style, but you can now set this via a conventional dialogue box from a right mouse-click menu. Another unusual touch is the fact that this dialogue also controls the style of box corners; not only can you round these but chamfer or invert them and even apply a different effect to each corner.

Two buttons at the bottom of the screen pop up the Status toolbar, which controls the size, position and rotation of objects, and our old friend the Changebar. This has been much streamlined and simplified and now contains just five sliders. It's a quick and clever way of adjusting font size and spacing, as changes take place in real time, but it's rather a bizarre way of changing fonts. It would probably be easier to use the button bar's drop-down list for this.

There's a scrolling colour palette at the right of the screen, with a ten-step shade control below. More Wizardry steps into action when you create a frame and import text or graphics, though as with the ubiquitous Tips boxes, you can turn these off as you become more confident.

Though somewhat simplified, typographical control is still precise, and the PlusWrite story editor can be used to edit and proof text. You don't get the professional colour support seen in the Windows 3.1 version — there are no Pantone libraries or facilities for creating colour separations. There are new tools for inserting and testing links for Web pages or hypertext documents, though you'll need to buy the Adobe Acrobat Distiller to create the documents themselves.

Although you don't get the bitmap and drawing applications bundled with the Publishing Suite, you do get LogoPlus, an OLE server that goes somewhat further than the competing type-tweaking tools. It has a similar look-and-feel to DrawPlus, letting you incorporate shapes and pictures into your logos, and you can layer objects by dragging tabs.

Finally, Serif fans will be pleased to learn that the Elvis Alert has been joined by similar features for Bill Gates and Aliens, with the latter featuring a WinVaders game.

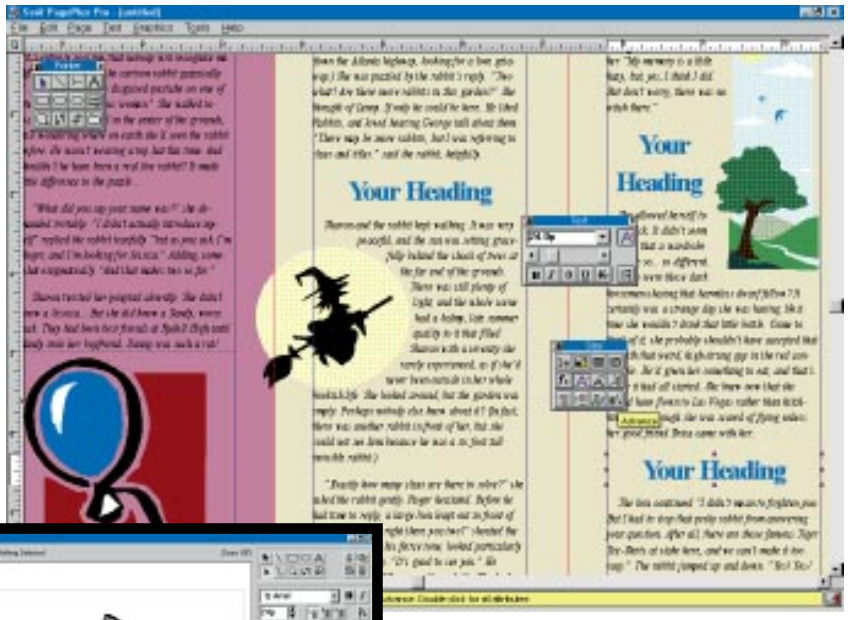
Tim Nott

PCW Details

Serif PagePlus Home/Office Edition
Price £49.95 (inc VAT)
Contact Serif 0115 942 1502

Good Points Streamlined interface and Wizards make this the easiest PagePlus yet.
Bad Points Lacks some of the advanced features of the Windows 3.1 version.
Conclusion A strong contender for the SoHo market. More ambitious users should stick to the Windows 3.1 version.

Serif Publishing Suite



Above *Serif Publishing Suite: nearly all the facilities of the top-level products at a fraction of the cost*
Left *The DrawPlus component of the Serif Publishing Suite — unconventional, but effective*

Although PagePlus is still available as a standalone product, we've included the Publishing Suite as Serif's Windows 3.1 contender. Last year the Serif PagePlus Bumper Pack broke all size-to-price records. The Suite, with a similar street price, goes even further. For the record, as well as getting version 3.0 of PagePlus you'll find DrawPlus (vector graphics), PhotoPlus (bitmap editing), TypePlus (for logos and fancy text effects), TablePlus (spreadsheet-style table editor), font and clipart packs, and a bonus CD with 400 more fonts and 7000 clipart items.

Although you don't get the interactive Wizardry of Microsoft or the Piloting of Pressworks, there's a lot of emphasis on user-friendliness. Numerous demos show you the ropes, and once you get started there are ToolTips and a hint panel that can be placed on the screen like a Post-it note. The interface has three levels of expertise — beginners can start out with a minimum of buttons and menu commands and work their way up to the full set.

The screen is kept comparatively free of clutter by the expedient of controlling practically everything from two floating palettes. The toolbox contains a set of buttons for drawing, placing text, rotating objects, importing graphics and cropping them. The Changebar is a little more complex, and its contents change to suit the current tool. If you're drawing a circle, for example, you'll see a slider, a drop-down list and five pre-set buttons for line thickness. Since a circle is a graphic object, you also get a button for the various wrap options, to repel or sit behind overlapping text. If you're using the text tool, you get buttons for bold and italic, with a list and slider for font size. The key to extra options is the button at the top right of the Changebar. Click on this and a further set of buttons, the Property palette, fly out and can be "torn off" and parked elsewhere on the screen. Clicking on one of these changes the function of the Changebar, so you can use it to change font, size, kerning, colour and so on. With a drawing object selected you can switch between altering the thickness, colour and linestyle. It's an excellent way of keeping a clear screen and avoiding complex dialogue boxes, but it can make changing several aspects of the same object rather long-winded. Size and position of objects is controlled from a conventional dialogue box with a button at the bottom of the screen, and there is no right mouse button functionality.

As with all the programs you can edit text in-place, but here you also have WritePlus which brings the text into a separate word-processing window where you can edit, search and proof in a similar fashion to PageMaker's story editor. Despite its budget pricing, the feature list is impressive. You can place objects to a thousandth of an inch, rotate to a hundredth of a degree and specify type size to a tenth of a point. Comprehensive colour support includes two Pantone libraries, process and spot-colour separations and automatic trapping. Serif prides itself on the fact that all its promotional and packaging material is produced using PagePlus.

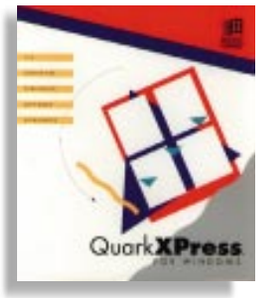
Another clever touch is that graphic objects can have "styles" as well as text, so you can apply a combination of line and fill attributes to a shape, or format a frame's background and border with a single click. Finally, just for fun, there's a built-in Elvis detector — a feature not found in any other package.

Tim Nott

PCW Details

Serif Publishing Suite
Price £100 (street)
Contact Serif 0115 942 1502

Good Points Impressive feature list at a budget price.
Bad Points Rather fiddly interface leaves room for improvement.
Conclusion Tremendous value for money and fun to use.



Quark XPress 3.32

Personal Computer World EDITOR'S CHOICE

As far as high-end DTP in the UK is concerned, Quark XPress reigns supreme, although it used to be a very different story.

Imagine the surprise at Aldus in the mid-to-late eighties, when newcomer Quark turned up, challenged the throne and took it within a couple of versions of XPress. A huge number of PageMaker users, including the many art departments at VNU, switched to XPress at version 3.1, leaving PageMaker severely beaten at version 4.

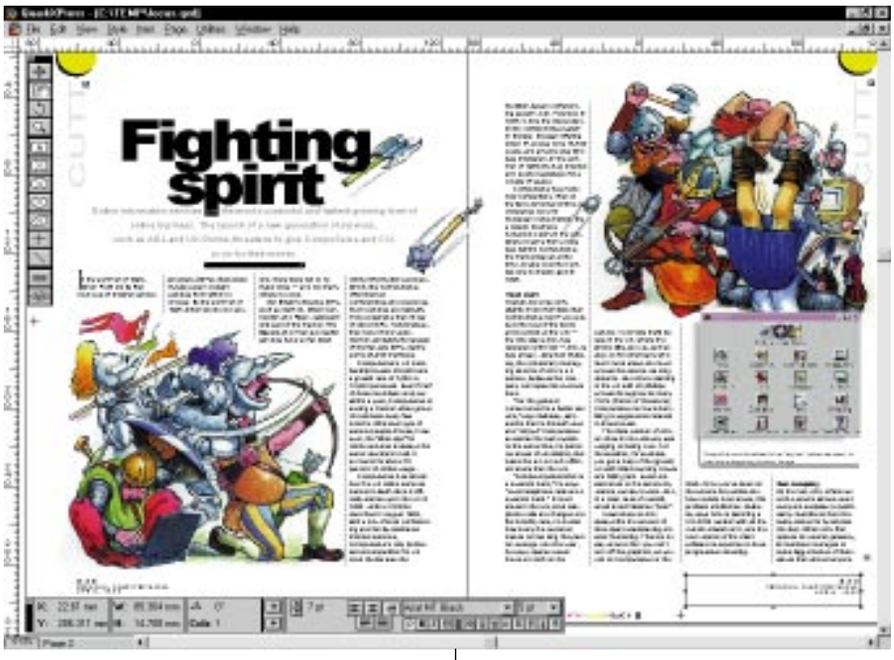
One of the greatest contributing factors to the XPress success story were XTensions, programs which bolt on to XPress to provide additional facilities. Third parties could write their own, offering total customisation.

It took Quark until just over three years ago to come up with a Windows version of XPress 3.1, and this was just before 3.2 arrived on the Macintosh. XPress still hasn't set the Windows community alight, which tends to go for lower-end packages or stick with the devils they know.

Quark at least now releases new versions simultaneously on all three supported platforms (Windows, Mac and PowerMac) and still remains comfortably on top of the Mac and, consequently, the professional publishing market. However, any product of this size and importance attracts its disbelievers, and XPress is no exception. Rarely a month goes by without a new Quark-beater being announced, but so far no-one has taken the crown.

Which brings us to the current version 3.32. Maybe it's the product's importance, or perhaps the fact that Quark regularly releases unreliable code, but the past few months have seen a constant flow of updaters and revisions on all platforms. Quark's Internet Web site does at least offer these updates for free, and we recommend checking it at least twice a month for the latest build.

XPress 3.32 isn't hugely different to XPress 3.1. A few useful improvements have been made, matching the smattering of new features PageMaker 5 boasted, including flipping of elements and skewing of pictures. The Collect For Output command which ensures no elements are left behind is handy, as is the auto-save and backup facility. Automatic greeking of pictures and text enables fast scrolling, while text itself can be interactively resized by dragging a box handle with a key held.



Here's a fine example of Quark DTP — a page from this very issue of PCW

There's a few additional XTensions and 19 graphics filters, including the facility to import spot colours used on EPS pictures, although infuriatingly it is not possible to save as an earlier version of XPress. XPress 3.32 will open any old XPress document, but once saved within 3.32, *only* 3.32 will re-open it. Opening 3.32 documents across platforms is successful apart from the usual problem of missing fonts.

Today's XPress 3.32 is fundamentally the same package it has been for the past few versions. Text still has to be placed in text boxes, and pictures in picture boxes, but you can now make them any shape. Typographical control is still the most precise of any DTP package, boasting sizes from 2 to 720 points in increments of a thousandth of a point. You can kern and track to 500 thousandths of an em space, and rotate or skew within one thousandth of a degree.

XTensions cater for the little that XPress cannot perform out of the box, which combined with almost universal acceptance makes it the only choice for many users. XPress is not suitable for the beginner: it has never, does not currently and is unlikely ever to come with free clip-art, fonts, feature Wizards or predefined templates. Its system requirements are fairly modest, but include support for PostScript printers only.

XPress's high price and market acceptance reflects the tasks for which it is relied upon daily. It still has a comfortable edge over PageMaker at the high-end, and is so established in its field that even a technically superior product would have difficulty getting its foot in the door. Quark XPress remains on top.

Gordon Laing

PCW Details

Quark XPress 3.32

Price RRP £895, street £560 (Mac and PowerMac RRP £995, street £650)
Contact Quark Systems 01483 454397
XChange for XTensions 0171 637 2966

Good Points Ultimate facilities and support.
Bad Points Expensive, not suitable for beginners.
Conclusion Still the best choice for professional publishing.

Electronic Publishing

There's a growing trend towards electronic publishing in the form of Web pages, portable electronic documents and multimedia: how is the world of DTP responding to the challenge?

Framemaker has been there for a while, but has made more impact on corporates than on the consumer market. Now we see several other applications offering facilities for creating electronic documents either in Acrobat-ready PostScript files, or in the HTML format used in World Wide Web pages.

The great limitation of the Web is bandwidth. High-resolution photographs and subtly textured background fills may look great on screen but the sheer time it takes to download them over a standard phone line curtails the creative urges of a Web page designer, as do the typographic limitations. Until the next broadband generation of communications arrive, using a high-powered DTP application in the creation of Web pages is rather like using a sledgehammer to crack a nut.

Portable electronic documents, on the other hand, don't need the Internet (although they can be sent across it). The idea behind the most common format, Adobe Acrobat, is that once equipped with an Acrobat Reader — which is distributed free of charge — the recipient can read a graphic and format-rich hypertext document on a variety of platforms. Unlike a word-processed document, they don't need the fonts on their system; the document is self-contained. Several of the products here will produce PostScript files with embedded hyperlinks, but you'll need the Adobe Distiller to produce the Acrobat documents themselves — and this isn't free.

As for multimedia and CD-ROM, conventional DTP software still has a fair way to go, chiefly because there is already a thriving market in multimedia authoring tools such as Macromedia Director or Asymetrix Toolbook. There is far more convergence between Presentation Graphics software and multimedia authoring than there is between multimedia authoring and DTP.

Assuming you're still living in the world of paper, once you've created your publication on disk, what do you do with it? This is really a question you should ask yourself before you type the first keystroke. How many copies? Colour, or black and white? What standard of print quality?

For limited edition black and white work that needs to look good but not "magnifying-glass immaculate", then an office laser printer is fine — especially at 600dpi (dots per inch). For larger quantities, you can save money by taking sheets of laser printer output to a local instant print shop. Or for professional results, take output files to a typesetting bureau which can produce ultra-high resolution bromides, from which the printing plates are made. Discuss what file formats are acceptable; some bureaux will want PostScript files, others may be happy with the native format of your DTP program. Check as well that the bureau has the fonts that are used in your publication.

Colour work complicates matters considerably. The price/quality ratio of colour printers is falling rapidly — it's now possible to get quality output from sub-£300 inkjets, and we're starting to see affordable examples of printers using techniques such as thermal wax transfer. Although capital costs have tumbled, the price of consumables is high, particularly when using the special coated paper needed to obtain the best results. This makes DIY colour output uneconomical for all but very small print runs.

For serious colour work, you're going to need outside help, but don't get rid of that colour printer — you'll need that to produce proofs. First, you need to decide whether you want to use spot colour, process colour, or both. The former will let you have certain items printed in a single solid colour. To take a simple example, black text with red headlines. In this case you'll need to separate the output to produce a separate printing plate for each spot colour. You'll need to "knock out" overlapping colours: if a yellow circle is placed over a blue square then the latter needs the circle knocked out so the inks don't overprint. Then, you also need to "trap" knockouts to provide a tiny overlap, so that slight misalignment or shrinkage during printing doesn't result in white gaps.

Process colour uses four plates (or more for ultra-high quality work) on which colours are "screened" to produce dot patterns which combine to give a full range of colours. You'll need to use process colour if you're working with photographs.

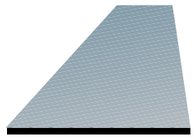
The Three Golden Rules of electronic publishing

- Talk to your bureau.
- Talk to your printers.
- Talk to your bureau again.

Common DTP Terms

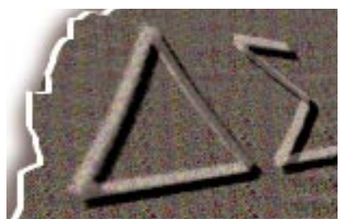
Point size
Type is measured by its vertical size, in units of points. There are around 72 points per inch, but a 72-point capital letter does not measure one inch in height. The point size stretches just beyond the highest ascender and the lowest descender of a particular typeface.

Leading
(pronounced "ledding") is the vertical space between lines of type. Before DTP, hand-set type was separated by strips of lead, hence the term. In DTP, leading is measured in points and expressed as the sum of the space between two lines and the type size itself. Lines of 12-point text may be separated by three points of vertical space. The leading would equal 15 points and the style referred to as 12 on 15 or 12/15. *PCW* box text style is 8 on 11.



Kerning and Tracking
Tracking is the adjustment of the horizontal space to the right of each character in a range of highlighted text. Kerning is the adjustment of space between two characters separated by the text insertion bar.

But why adjust letter spacing manually? Because two letter Os side by side look tighter than a letter W and a letter A, thanks to the sloping lines of letters like A, V and W. These are situations which would justify manual kerning to tighten things up.



Greeking
Greeking is a process where text is greyed out at a certain user-defined size. This considerably speeds up the redraw process, without compromising general design. Zoom out from your page and the body copy could greek, leaving the larger headlines readable. Some applications allow the greeking of pictures, usually to speed up scrolling. When the scrolling stops, the pictures come back.

Alignment
Alignment is the placement of text relative to the margins. Four basic varieties exist:
Flush left or **Ragged right**, where the text lines up on the left-hand side like a traditional letter.

Flush right or **Ragged left** where text lines up on the right.

Centred where each line is centred between the margins with equal space on either side; and finally

Justified where the spaces between words are adjusted so that the words at the end of each line are forced to line up with both left and right margins, in the style of many magazines.

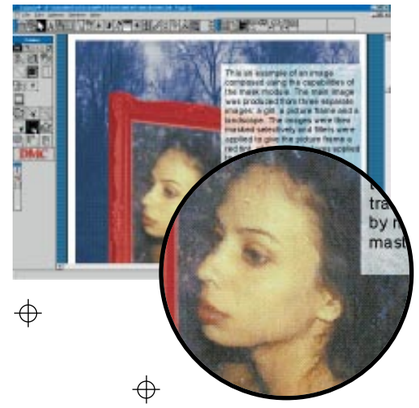
Justified text works best where there are two or more columns side by side, although long words frequently cause messy-looking large spaces to occur.

Widows and Orphans
A widow is the first few lines of a new paragraph standing at the end of a column, or the last word of a paragraph sitting on its own on a new line. An orphan is the last few lines of a paragraph standing at the top of the next column.

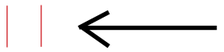
In all cases, this creates an overall untidiness. It's good practice to clean up by cutting or adding to the text, or adjusting the column length.

Bleed
Any element, most commonly a photograph, that runs off the edge of a page. When laying out a page with elements that bleed, the designer deliberately places them over the page boundaries. When output, the edges are chopped off, resulting in, say, a photograph that goes right up to the edges of the page.

Crop and Registration marks
When printing on larger paper than the document size, crop marks are used to indicate where the document should be cut out. Registration marks are placed in the same spaces around the layout edges, enabling film to be correctly lined up when separated into individual colour passes.



Alley
The space between adjacent columns of text.



Gutter
The space between the adjacent inside elements on two facing pages. This is to compensate for the page space lost in the binding of the publication. The more pages, the larger the gutter.

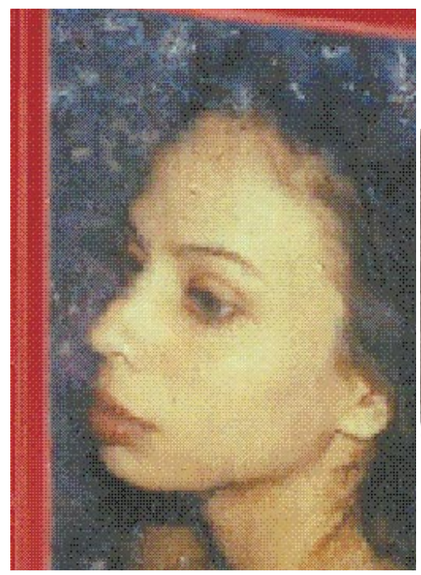
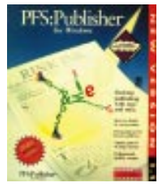


TABLE OF FEATURES

Product	Microsoft Publisher 3	GSP Pressworks 2.02	Softkey PFS Publisher 1.1	Serif Publishing Suite 3.07	Serif PagePlus Home/Office
Contact	Microsoft 01734 270000	GSP 01480 496575	Softkey 0181 789 2000	Serif 0115 942 1502	Serif 0115 942 1502
Platform	Windows 95	Windows	Windows	Windows	Windows 95
Price	£70 (street)	£39.95 (RRP inc VAT)	£39.99 (RRP inc VAT)	£99 (street)	£49.95 (RRP inc VAT)
Min processor	386DX	386SX	286	386SX	386
Min/Rec RAM	6Mb	4/8Mb	2/4Mb	3Mb	8Mb
Min/Full disk space	6/32Mb	7/22Mb	3.5/6.5Mb	5/40Mb	5/95Mb
Multiple Documents	❍	❍	●	❍	❍
Multiple master pages	❍	❍	❍	❍	❍
Table of contents	❍	❍	●	❍	❍
Indexing	❍	❍	❍	❍	❍
Tagging	❍	●	❍	❍	❍
Table creator	●	N*	❍	●	❍
Kerning (Auto/Manual/None)	A/M	M	❍	M	A/M
Shaped text wrap	●	●	●	●	●
Text rotation	●	●	❍	●	●
Auto-hyphenation	●	●	●	●	●
Process colour seps	❍	●	❍	●	❍
Spot colour seps	●	●	❍	●	❍
Pantone support	❍	●	❍	●	❍
Panose font matching	❍	❍	❍	❍	❍
OLE support	●	●	●	●	●
HTML support	❍	❍	❍	❍	●
Adobe Acrobat support	❍	❍	❍	❍	●
Fonts included	21	35	12	400	100
Clipart included	203	104	112	7000	1000

*available separately



KEY ● Yes ❍ No

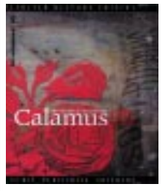
Editor's Choice

For high-end publishing Quark XPress is king and is likely to stay so for the forseeable future. Most colour magazines (including this one) are produced on Quark and although the once-favourite PageMaker has done a lot of catching up, particularly with Plug-ins and multiple master pages, it still isn't ready to shake what has become a deeply-rooted tree. Hence for high-end work, Quark remains Editor's Choice.

At budget level, the competition is red-hot. Though PFS:Publisher is past its prime and Calamus is just too quirky to have wide appeal, the rest of the under-£150 packages offer excellent value for money. For serious work at a budget price, the Serif Publishing Suite probably offers the most, although GSP Pressworks comes a very close

TABLE OF FEATURES

Product	Jaks Calamus 95	Channel Corel Ventura 5	Frame Tech. FrameMaker 5	Adobe Systems PageMaker 6	Quark XPress 3.3
Contact	Jaks Graphic Design 0144 2483420	Channel Market Makers 01703 814142	Frame Technology 0181 606 4100	Adobe Systems 0181 606 4000	Quark 01483 454397
Platform	Windows 95	Windows	Windows/ Mac/Unix	Windows/Mac	Windows/Mac
Price	£149 (RRP inc VAT)	£349 (RRP)	£695 (RRP)	£515 (street)	£795 (RRP)
Min processor	486	386	386	486	386
Min/Rec RAM	16Mb	8/16Mb	8/12Mb	12Mb	4Mb
Min/Full disk space	23/150Mb	6/35Mb	10/30Mb	20/45Mb	9Mb
Multiple Documents	❍	❍	●	●	●
Multiple master pages	●	❍	●	●	●
Table of contents	❍	●	●	●	●
Indexing	●	●	●	●	●
Tagging	●	●	●	●	●
Table creator	❍	●	●	●	●
Kerning (Auto/Manual/None)	A/M	A/M	A	A/M	A/M
Shaped text wrap	●	●	●	●	●
Text rotation	●	●	●	●	●
Auto-hyphenation	●	●	●	●	●
Process colour seps	●	●	●	●	●
Spot colour seps	●	●	●	●	●
Pantone support	●	●	●	●	●
Panose font matching	❍	●	❍	●	❍
OLE support	●	●	●	●	●
HTML support	❍	❍	●	●	❍
Adobe Acrobat support	❍	●	●	●	❍
Fonts included	24	691	13	220	0
Clipart included	16.5Mb	17000	750	0	0



KEY ● Yes ❍ No

second and is cheaper.

But for the most gain with the least pain, together with all the benefits of Windows 95, the sheer ease of use of Microsoft Publisher makes it a natural choice for the SoHo user c the corporate user for whom preparing smart looking publications is a sideline rather than their main job, and therefore gains our Highly Commended award — just beating the less expensive PagePlus Home/Office Edition.

shere.

Microsoft's intentions to design features into its software to assist visually impaired computer users have met with a favourable response from the BCAB.

THERE ARE DAYS WHEN YOUR PC seems to have the upper hand. You go in, install something and end up with half of it glued to your system, sending up error messages. You spend the next hour sifting through your Windows directory searching for rogue files and modifying your config.sys. Now imagine having to do all that without being able to see your screen clearly.

To a sighted user navigating any GUI environment, whether it be Windows, OS/2 or X Windows, most tasks seem relatively simple. You can see what you have and where it is. Accessing files is just a matter of point and click. But without full vision, GUIs are like being locked in a game of Doom. You can never get the full picture, dead ends are around every corner, and unless you know where you are going, you can get hopelessly lost. To navigate properly, you need an excellent memory and some very expensive aids.

Special needs

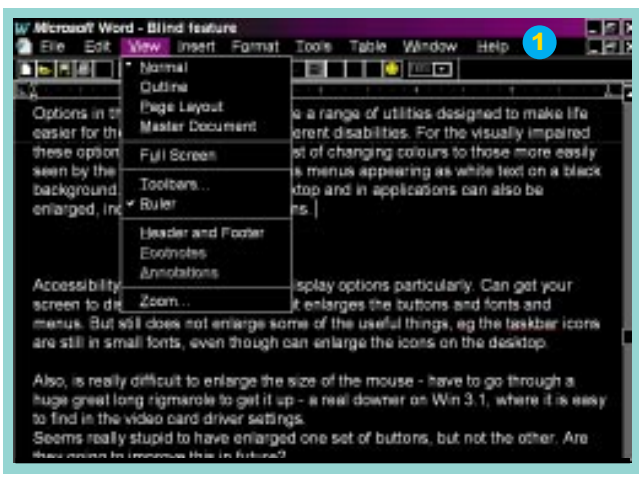
For the visually impaired, access to a GUI environment is variable depending on their particular condition. For some users it is enough just to use a larger screen or a monitor stand that allows them to pull the screen closer. Others need a screen magnification program, while some need speech as well. Magnification programs have been available for some years. They do not need to understand what they are magnifying, but enlarge a portion of the screen on a pixel-by-pixel basis.

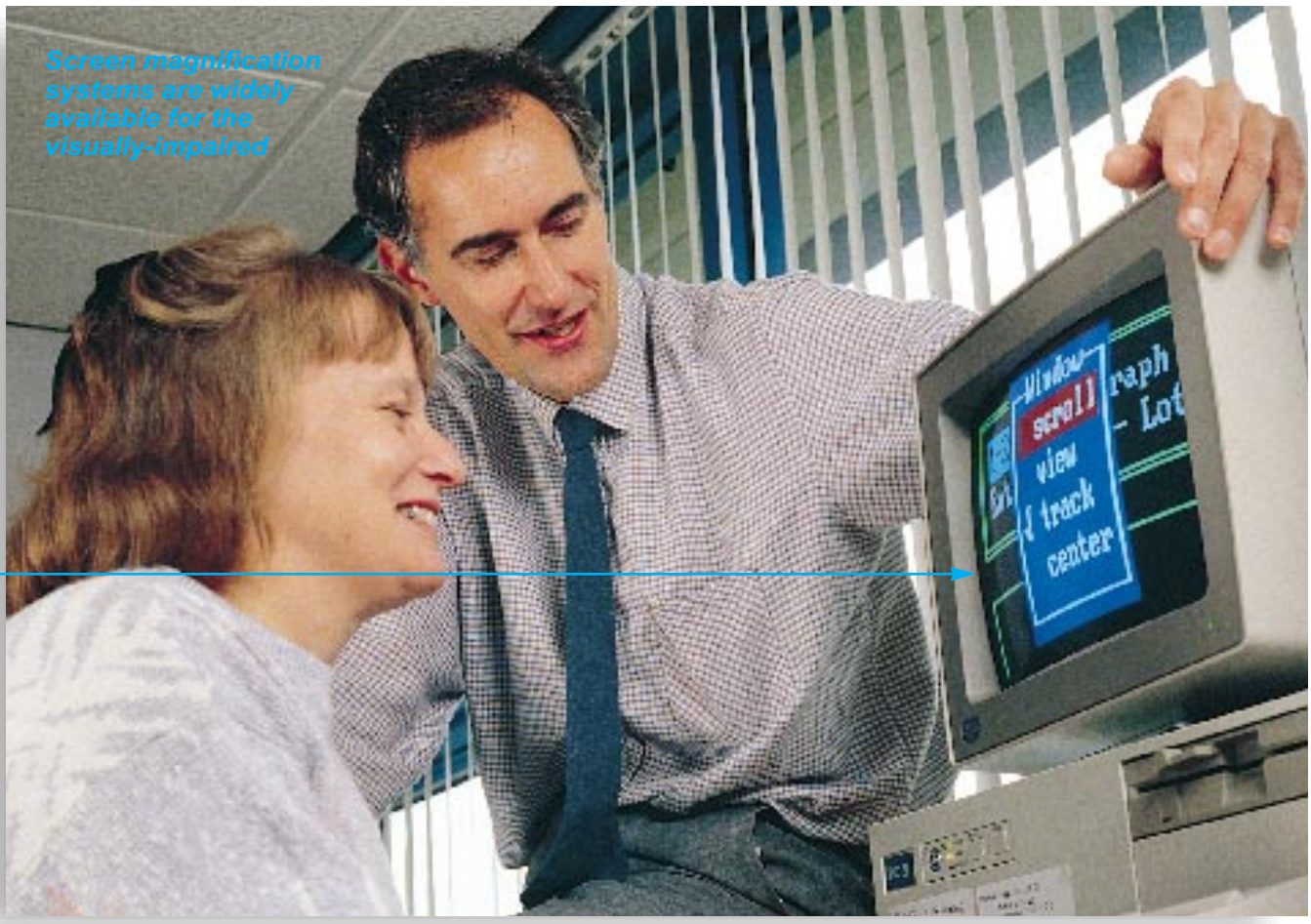
Blind users have had access to Windows at an adequate level only over the last 12 months. To get access now, they need additional hardware: either a Braille reader or a speech synthesiser (preferably both) to read the screen. Both of these are easier to operate under DOS, which is entirely ASCII-based, but are apt to fall down using certain applications under Windows.

DOS is a much easier operating system for the blind to use. However the realities of the working world mean that almost every blind user has to use Windows to some extent. The RNIB said they knew of very few DOS-only users. This has caused problems in the past. Everyone I spoke to knew of at least one blind user who had either lost their job or taken early retirement due to the predominance of Windows.

Paul Holliman of the British Computer Association of the Blind had to reassess his career course because of Windows. He now uses WinDOTS, a Braille display system first developed in 1993, but sees the root of the problem as the lack of a basic framework on which to hang fully functioning screen readers: "In Windows 3.x there was no provision for screen readers, so developers have had to make lots of hooks and bodges to get things to work. It is very much a question of horses for courses. My system falls over on both Mosaic and NetScape, so there are teething problems."

Holliman himself works in in-house support, advising sighted users on the problems with Windows. He can work around the problem by using hotkeys and





Screen magnification systems are widely available for the visually-impaired

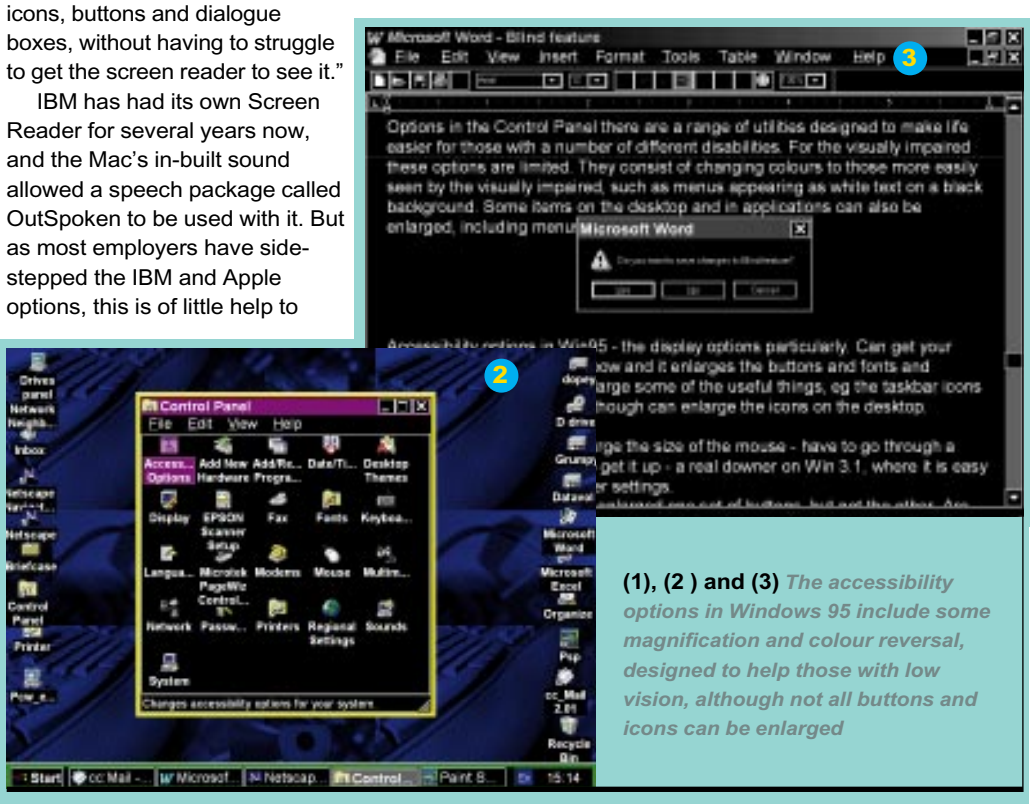
relies on his knowledge of the system to iron out any hitches, but concedes it is not a perfect system. "The ideal would be to guarantee to use the basic things — icons, buttons and dialogue boxes, without having to struggle to get the screen reader to see it."

IBM has had its own Screen Reader for several years now, and the Mac's in-built sound allowed a speech package called OutSpoken to be used with it. But as most employers have side-stepped the IBM and Apple options, this is of little help to those who use Windows at work.

Paul Holliman complained that for years the BCAB had tried to talk to Microsoft about the need to take blind users into consideration when designing operating systems and applications. Then in 1990, the Americans with Disabilities Act was introduced in the US, making it compulsory for all employers to make provision for disabled workers. Suddenly the ball was in Microsoft's court.

Steve Plumpton of the BCAB reserved judgement about Microsoft's sudden interest in the disabled: "In the last 12 months, Microsoft have changed their attitude to how they help visually-impaired people. With Windows 95 coming out they had to do something about it. They would have lost billions of dollars in revenue if they had not gone along with the new legislation in the US."

This desire to do something first became apparent in the summer of last year. Steve Plumpton said he and the BCAB committee members were aware of stirrings from



(1), (2) and (3) *The accessibility options in Windows 95 include some magnification and colour reversal, designed to help those with low vision, although not all buttons and icons can be enlarged*

Hardware and software

The amount of hardware and software you will need as a visually-impaired computer user will vary widely accordingly to your condition. Those with a mild visual impairment might get by with only a monitor stand priced from £20, while blind users can spend in excess of £8,000 on a Braille display.

Totally blind users need a Braille display, a speech synthesiser or both. Braille displays usually consist of a line of between 20 and 80 dots, which presents in Braille form the text in the active window. They occasionally have a second, vertical line of dots which represents the graphical contents of the screen.

Speech synthesisers connect to the PC in a variety of ways, either via an interface card, the parallel port or in the form of a PC card. All are capable of speaking each individual word or letter. They do so in a fairly stilted manner, and in many cases in an American accent, but I am assured by a regular user that you quickly get used to the electronic drone. Speech synthesisers can cost anything from £295 to over £3000.

Both Braille displays and speech synthesisers need a screen reader to interface with the operating system. Until recently, there were no screen readers for Windows, although one existed for OS/2 and the Mac. Developers have now produced screen readers for Windows, but as they were not considered in the original design, it's a patchy job. Again, you get what you pay for, and you can get a screen reader for £85, but the most expensive versions cost £1500.

Screen magnifiers are less expensive as they are relatively simple software applications, with basic packages starting from £80. They increase the size of the image on the screen by up to 16 times, although most users are advised to use a speech synthesiser as well if they need over eight times magnification. More complex systems can cost up to £2500.

The option of a larger screen is often highly recommended, although this again adds to the costs involved. A good 21in monitor will cost around £1500, although you can get one of questionable quality for around £1200.

For more information and advice, contact the RNIB's Education, Training and Development Unit on 0171 388 1266.

Microsoft and kept their ear to the ground. "We heard about the move for change about April of last year and through various BBSs we gathered Microsoft were building up their team in June. One of our committee members met someone working in this team and persuaded them to invite us to the Microsoft Accessibility Conference in Seattle last July."

Good moves

The BCAB sent Paul Holliman out to the conference. Despite initial scepticism, he came back pleased with the moves being made. "They are building in features so that we can get direct access. It should not take us another five years to get access to Windows 3.x. They are going to get OLE to work properly. The developers will be working towards smoothing out the problems. The people there are very positive in what they want to do. They did not blind us with science and they did not try to fob us off with promises of things far in the future."

The main aim of Microsoft's Accessibility Group is not to develop their own screen readers, but to help third-party developers of such things as screen readers. Luanne LaLonde, accessibility product manager for the personal systems division, explained Microsoft's attitude: "Microsoft does not create its own screen readers. We are looking to enable developers to produce better products. We believe that the expertise for these products lies elsewhere, so what we are trying to do is include tools in our code that will make their job easier."

To this end, the accessibility group spend a large proportion of their time supporting ISVs (independent software vendors) in this very specialised area. The conference was an extension of this as the accessibility group listened to developers and eventual end-users, spelled out their own plans and held workshops on the changes they are implementing.

Focus on accessibility

The conference did not concentrate purely on the issues of Windows for the blind, but also covered accessibility options for other handicapped users, such as the deaf and those with problems typing. However, LaLonde says: "Creating accessibility for the blind is our biggest challenge. It is very difficult to create good software for blind GUI users… We just hope to do our part to make the products better."

In the future, Microsoft would like to include such features as video description (where a description of the actions on-screen is added to the soundtrack of a video) and close captioning, or subtitling for the deaf. These are both ambitious projects however, and are only in the initial stages of development.

With a little help from Win95

At present, some features to help those with low vision have already appeared in Windows 95. In the Accessibility Options in the Control Panel there are a range of utilities designed to make life easier for those with a number of different disabilities. For the visually-impaired, these options are limited. They consist of changing colours to those more easily seen, such as menus appearing as white text on a black background. Some items on the desktop and in applications can be enlarged, including menus and buttons.

Other items are not affected. Message box titles, for example, are enlarged but not the actual buttons themselves. Icons on the desktop and their titles can be enlarged, but not the toolbar icons in applications such as Word. To increase the size of the mouse, you have to go back into setup and install new code. According to Microsoft, some of these problems are inherent in the applications themselves. For example, in some dialogue boxes the size of the buttons cannot be affected as they have been hardcoded to prevent interference with other Windows.

While the jury is still out on Windows 95, there is hope for the future. Everyone I spoke to at the RNIB and at the BCAB were hopeful that good things were going to come of Microsoft's new approach. While all developers may be a long way from ideal solutions, things are finally looking up.

Adele Dyer

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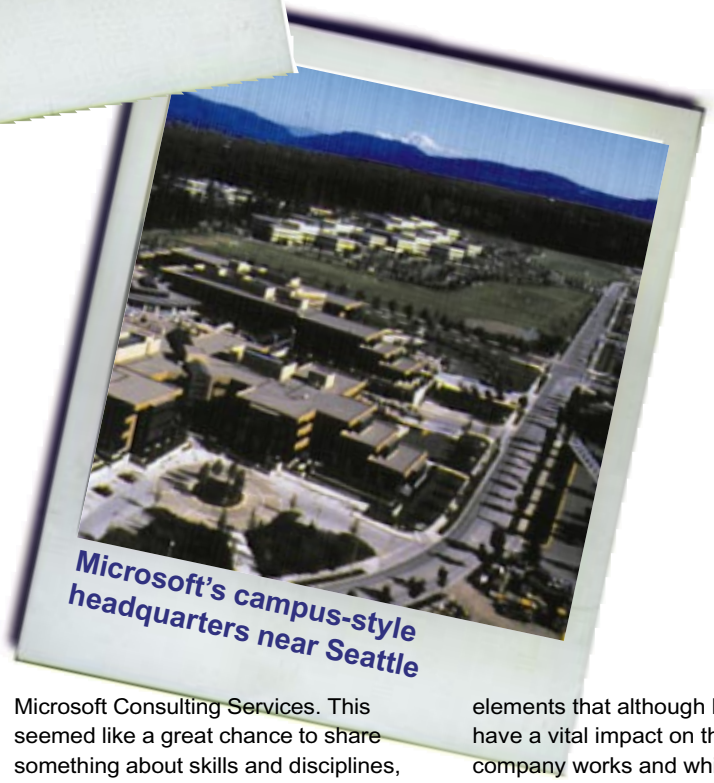
Blind Related Links page
http://dialin.ind.net/~rmarriag/rblind.html#adaptech
Microsoft Accessibility and Disabilities Program Web page
http://www.microsoft.com/salesinfo/accessib.htm

How *do* they do that?

...or, how the world's most successful software company develops its products.



Microsoft's campus-style headquarters near Seattle

How does Microsoft plan for the future when it comes to designing and developing its products and technologies?

Questions about the techniques and method used within Microsoft are the most common — people want to know about the Microsoft approach. To find out first hand for *Personal Computer World*, I headed across to Microsoft's head offices stateside to meet the developers on the Microsoft Visual C++ team.

"We were always getting asked this question and wanted to take the opportunity to share our experience and approaches with the development community," said Adam Warby, head of Microsoft Consulting Services. This seemed like a great chance to share something about skills and disciplines, not just technology."

The bulk of Microsoft's development takes place at its head offices in Redmond, a small town 20 miles outside Seattle. The main site, which is simply referred to as "the campus", has some 30 or so two- and three-storey buildings, set amid scenic pine trees and open playing fields. It is reminiscent of a university, a view reinforced by the jeans and T-shirts that are the standard dress code. Though the main goal of the visit was to look at the way the teams and design processes are organised, there are many additional elements that although less tangible, have a vital impact on the way the company works and which are reflected in the Microsoft culture.

Individual product teams tend to be located in their own specific building on campus, which in the case of the Visual C++ group is building 25. Here, as with elsewhere, everyone has their own room which they organise as they see fit. These rooms contain everything from hi-fi systems to sofas, not to mention the odd piano or arcade machine. Occupants are ensured privacy and quiet when they need it; if a door is shut, it usually means someone does not want to be disturbed. As the buildings operate 24 hours a day,

people are free to come and go as they please.

Within the development buildings, conference rooms are noticeable by their absence; rather than large, formal meetings, you are more likely to find people talking in doorways, chatting next to the coffee machine or communicating through email. Email is the lifeblood of communications within Microsoft — it's not unusual to receive several hundred messages every day. Not all of these are personal messages: the mail system is split into a number of special interest groups, or "aliases", where the messages are focused on particular Microsoft products or technologies. By joining that alias, and posting messages to it, everyone is given the chance to participate in the flow of information.

On the waterfront, complete with pine trees and swans

Team spirit

Microsoft development projects are small, cohesive and efficient teams staffed with highly experienced, technically knowledgeable and self-motivated team members. In the case of larger products such as Visual C++, work is divided into functions or "feature" teams, each working on a specific aspect of the product. For example, for Visual C++ there is a build tools team, Microsoft Foundation Class (MFC) team and an IDE (Integrated Development Environment) team.

Microsoft is unusual in not having explicit project managers — this role is shared between a number of people. A team model, which defines a number of different roles, each with their own specific responsibilities and goals, is used extensively within the company. Product managers provide input from the marketing side, and thus have an in-depth understanding of technologies and products and their potential audience. They work to establish the business case for a project and assist in identifying key priorities. Program managers own and drive the specification for a particular product's features and functionality, and provide a lot of the day-to-day co-ordination work. While program managers need a variety of project management and communication skills, they always have a strong technical background. The role impacts across the board on product functionality, implementation and delivery. The development teams, who actually implement the code, are headed by "leads" who take responsibility for the actual development process, ensuring that the various tasks are assigned to programmers with appropriate specialist skills. All teams work with Quality Assurance (QA, sometimes referred to as "testing") throughout the design and development stages so that quality levels are met at all stages.

Achieving the optimal balance between these roles is essential on all projects. Walter Sullivan, MFC program manager for Visual C++, explains how the relationships work: "Within the Visual C++ team, the program manager works with the development lead to maintain the schedule, and to interface to other teams or groups within Microsoft. Program managers own a 'feature', such as a set of build tools, and ensure that QA, user education and marketing fully understand it. They also help maintain the customer focus, working with product support and online forums to drive the design process. The development lead, on the other hand, has the 'visionary' or 'technologist' role, tracking new technology that we need to support, as well as working with the developers on the code."

'While program managers need a variety of project management and communication skills, they always have a strong technical background'

One technique Microsoft has used to great effect over the years is iterative product releases. Each application has a product life cycle of one to two years, which allows the designers and developers to take a longer-term view of the product's evolution, enabling them to focus on the key features in each release while still being able to react to changes in technology, customer demands and market forces.

Milestones

Each release goes through four distinct phases: scoping, design, development and release. Each of these in turn has a specific milestone which is used to measure progress, both within the product group and within other parts of the company. Within each of the four phases there may be a number of internal milestones used to prioritise development tasks and to schedule work internally within the teams.

Phased delivery is not a new idea within the computing industry; rather, Microsoft has used some of the ideas in new ways that are better suited to the rapidly changing PC marketplace. For example, milestones don't imply that all work is frozen at that point. Rather, any changes after that point are put under change control, a process that enables the design and development of a product to be continually refined, right the way through each cycle.

Each release of a Microsoft product is accompanied by a vision statement that defines the key features and focus of that particular release, and provides direction at a high level. Adam Denning, a program manager within the Visual C++ business unit, explained that "each major release of Visual C++ is characterised by a small set of paradigms stating our goals for the product up-front. For Visual C++ 4.0, the main paradigm was 'sharing and reuse', which we achieved through features such as the component gallery, OLE controls and MFC."

The second major milestone for a product is the functional specification, which provides the project team with a sufficient level of detail about the product so that work can start to identify resources and draw up schedules. This milestone is used to articulate exactly what will be delivered, assess risk and establish priorities. In cases where the framework for future releases is already


Striking out on a home run, but mind those windows...

in place, these first two stages often overlap quite heavily.

As Visual C++ 4.0 had been released for manufacturing just a few weeks prior to my visit, MFC program manager Walter Sullivan and his team were busy working out the details of the features for the next release of the product. In line with the iterative model used, this process had already started some time earlier: as a product nears its release date, development effort starts gearing up for the next release, thus maintaining the momentum and minimising delays. Since Visual C++ works on a quarterly subscription cycle, Walter's work was focused on the version 4.1 and 4.2 releases, as well as scoping out the key features for version 5 of the MFC. This latter process is shared between Walter, the MFC lead and QA, with ideas coming from within the development team, and from other groups.

Development up to deadline

The third phase is development. The development team will set a number of interim milestones on the way to their "code complete" milestone. Greg DeMichillie, one of the product managers within the Visual C++ team, sees the use of milestones as a vital part of the way Microsoft works. "Milestones expose lots of integration and dependency issues that might otherwise stay below the surface. A milestone will typically specify a number of scenarios that should work, for example, creating a new application with the wizard, selecting the database option, then adding a database view into the code. It is important not to 'fudge' a milestone: if it takes an extra two weeks of work to achieve it, do it. If it does take that extra two weeks, it is your first, and often the only, guide you have that the project is behind schedule. Without such metrics, we wouldn't know until the final deadline."

In the case of Visual C, there may be three or four internal development milestones. Key features are usually scheduled first, and less important features are associated with later milestones. This approach means that if changes need to be made in either release dates or product functionality, they are less likely to impact on major features. However, key product features can't always be developed upfront: for example, a specific new feature may require extensive coding, so it often makes sense to start such tasks earlier on to minimise risk. Some features may also depend on other parts of the product, and so cannot be scheduled until later on. Any major changes to the user interface tend to be scheduled for earlier development, so that they have the opportunity to undergo usability testing at the Microsoft usability lab. Greg pointed out that "not all designs that look good on a whiteboard translate into user-friendly programs, so the usability lab is vital for obtaining feedback, which sometimes means we may need to do some re-coding."

'Not all designs that look good on a whiteboard translate into user-friendly programs, so the usability lab is vital for obtaining feedback'

Each team builds its software on a daily basis, with each build designated a "build number" that is used to identify it (the release version of Windows NT version 3.51, for example, was build 1057, and it is this build number that is displayed briefly when Windows NT first loads). Interim internal builds may not have all the features present, or even working, but each build provides a stable base for development. One of the worst things a developer can do is to "check in" code (product groups use either Source Safe, or an older internal source code control tool known affectionately as "Slime"), that breaks the build. As a deterrent, some of the product groups resort to playful pranks on such individuals to ensure that this does not happen too often.

Once a product is "code complete" the focus is on detecting and fixing any remaining bugs in the run-up to the release to manufacturing (RTM) milestone. One aspect of QA that surprises many people is the ratio of developers to QA people within Microsoft — usually one-to-one. QA is a viable career route in its own right within the company, and QA people tend to work on a "buddy-buddy" basis with developers, from the design stages right through the development process.

Invitation to the Bugbash

Bo Simmons, one of the QA leads for Visual C++, is responsible for the "box" team. This is a catch-all term that refers to the miscellaneous elements that go into the Visual C++ box alongside the compiler and build tools, including the "setup" program, code samples and SDKs.

One of the ways Bo helps maintain the customer focus on quality within Visual C++ is to use a technique known as the "Bugbash". He and his QA team create a number of customer "scenarios", designed to test the product from end to end; one example of a scenario might be using the AppWizard to create a new Visual C++ application, adding a specific feature, stepping through the code in debug mode, and checking the online help for a particular function.

For each bugbash some hundred or so scenarios are set up in a database, and people from across the entire


Where do you want to go today? The café...

product team — development, quality assurance, program management, user education, marketing and product support — are invited to participate. It is not uncommon to have anywhere from 50 to 100 people in the bugbash evening, running through the scenarios. Any bugs found are put into RAID, Microsoft's bug tracking system. At the end of the bugbash, all the testers get food and beer and prizes are given for the most obscure bug found. Though there is a sprit of fun at these events, they serve a serious purpose. In the case of Visual C++ 4.0, there were five bugbashes before the product shipped.

Sniff tests

One of the key ways in which quality is maintained during the regular build cycle is through the use of "sniff" tests, specifically in areas such as the IDE. These are automated test programs, developed by QA, that test for certain basic levels of key functionality. In the case of the Visual C++ team there is a core system suite of basic sniff tests, along with a set of sniff tests for the various elements of the Visual C++ package, such as the text editor, resource editor and wizard. Before developers can check code back in, they must run through at least two of the sniff tests — the core system suite, and at least one other that is relevant to the areas they have been working on.

"For other areas of the product," comments Bo, "like the compiler and build tools such as the linker, we may have more stringent check-in criteria. This can depend on the nature of the code change. We basically require the compiler to fully self-build (that is, we have to be able to use the current compiler to build a new version with the code changes). This new one is then used to rebuild again, and finally, we do this a third time. Also, there have been times where we require the compiler/linker to rebuild the entire VC++ product (IDE, MFC, tools and C runtime libraries) before the code is checked in. We also do integrated builds where we build the runtime libraries first, followed by the compiler and linker, followed by MFC, and finally the IDE. We find and shake out many integration and product problems this way."

As with most Microsoft processes, the build process is open to ideas that can improve it. While I was visiting, the team was experimenting with some new ideas. If a developer had more than ten bugs assigned against code they had written, new development couldn't continue until the bugs had been tackled. In this way, focus can be maintained on creating high-quality code.

Lon Fisher, responsible for QA on MFC, says of the role of QA: "Software is inherently untestable. Within Microsoft testing is done at several levels, and a number of different test tools are used. A high degree of emphasis is placed on automated testing and testing tools; obviously Microsoft Visual Test is used often, as are C or C++ harnesses (mainly for testing operating systems and API layers), and Visual Basic for Applications if the product has its own scripting language (Windows NT had over two million lines of test code written). While not every sort of testing lends itself to automation, such tests are a vital way to ensure that when new features are added or bugs fixed, they do not affect the stability of the product.

In order to maximise re-use of such tools, a "Test Fair" is held every year, in which the product groups show off the tools they have developed, giving the other teams a chance to see if they can be applied within their own work. These Test Fairs have their own trade show atmosphere, and as with other such internal Microsoft events, the aim is to lever work from one group to another.

I took the opportunity to speak to Roger Sherman, formerly director of Testing and now group program manager of the Microsoft Solutions Framework (MSF) team. The role of the MSF team is to bring together the best practices and technology initiatives from Microsoft product groups, Microsoft Consulting Services and Microsoft's own internal IT group. The team also provides training material for the consulting arm of Microsoft and its clients, a role that fits well with Roger's training and focus on software quality.

How trade-offs work

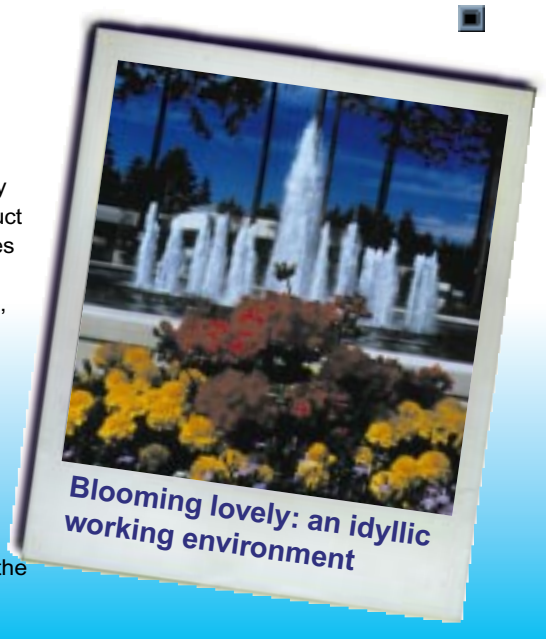
One of the areas that our conversation covered is the way Microsoft continually makes scoping trade-offs in each product release, a concept that many companies have difficulty coming to terms with. He explained how this works. "At Microsoft, the quality of a product is defined in three dimensions. The first is product definition, or what is sometimes called the feature set. The second dimension is schedule. Schedule is often thought to be the enemy of quality, but at Microsoft it is considered to be part of the quality of the product. The third dimension is the traditional focus of Quality Assurance: reliability — defined as the rate at which an end-user will encounter anomalies. The capability of high performance in each of these three areas is most important, but as soon as you begin to develop a product, you begin making trade-offs in these three dimensions. A high-quality product is one where the trade-offs between these three dimensions are the same as those trade-offs the customer would make.

"Depending on the market and available technologies, the relative importance of each of these quality dimensions differ. Features might be cut from a product to increase the amount of time available for testing, or to increase the certainty of making a ship date. At Microsoft, development, testing, program management and product support groups decide as a team to make carefully considered trade-offs between the three dimensions of quality, from the time coding begins until they agree that the product is ready to be shipped to customers."

In the case of Windows 95, the key goals were feature and quality based, and so Microsoft made a conscious decision to focus on these goals and not to ship the product until they were met, even though this meant delaying the launch. In the case of Visual C++, however, as it is released on a quarterly subscription basis, the schedule is fixed and so the feature set is built around the time available between releases.

David Gristwood

David Gristwood was a regular contributor to Personal Computer World and now works as a consultant within Microsoft Consulting Services.



Blooming lovely: an idyllic working environment

Six in the side pocket

The personal digital assistant has come of age. Right on cue we've pooled six palmtops for review and chalked up a winner.

TIME WAS WHEN EVERYONE WHO was anyone had a Filofax or some kind of paper organiser. They sneered at electronic organisers; the toys were for techies who didn't mind the weight of batteries and poor displays.

But as technology progressed and the ring binders began to bulge, the size and weight of the paper versions overtook the electronic ones. The type of organiser into which you put batteries had one great advantage — if you lost the gadget, you didn't necessarily lose all your contacts, they could be safely backed up on to your PC.

Fans of the paper system could, until recently, argue that tradition had flexibility on its side. You needed to be particularly adept with a combination of vertical bars and underscores if you wanted to draw a map, but with the newer and better PDAs (personal digital assistants) you can now sketch. What's more, the pen allows the machines to employ easy-to-use graphical interfaces.

There have been many developments in pocket machine technology and numerous failures along the way: Poqet, Agenda and others. Soon there will be new machines from the likes of IBM, Psion and the many Japanese companies with the appropriate technologies. Even Philips may make an entry. But today, the personal organiser has already come of age. It can do many things a diary cannot, from waking you up in the morning to calculating the dialling code for Kuala Lumpur.

A modern pocket organiser can do many of the things we expect from desktop computers. With email becoming essential and mobile phones ubiquitous, the ability to log on from the lavatory is becoming more than a luxury. Nowadays it isn't just the computer techie who has a personal organiser. Organisers are useful, stylish, indispensable and used by everyone from Jonathan Ross to Lord Young.

Simon Rockman

Apple Newton Messagepad

The Apple Newton is the archetypal PDA: a machine which can act as your personal assistant and is so easy to use, it needs no instructions.

When the Newton was announced it was to be the way forward; a machine without a keyboard.

Apple set about it the right way: solid basic research, a new operating system and the cleverest handwriting recognition yet. The ARM processor was chosen to provide a lot of processing power without consuming a lot of battery power. Others who tried similar projects — the Compaq, and the Microsoft Mobile Companion — gave up at the first hurdle.

PCW Palmtop Photography by David *Whyte*

Although the Newton made it on to the market, it nevertheless failed to become the machine everyone wanted.

The handwriting recognition, although jolly clever, was also very slow, and the machine was

still too power hungry and expensive. Only the dedicated Apple lover stuck with it.

Today, the Newton is a little different. There is an excellent selection of applications. The handwriting recognition is still too slow for rapid note-taking but there is the option to use quicker, character-based recognition and if that is still too slow — often the case — then there is an optional keyboard. A little bit of practice helps with the handwriting speed and when you are good at it you can easily jot notes — but not at copy-taking speed. The pen interface is easy to use, although not as simple as the OmniGo 100's.

Where the Newton has been a hit is in the specialist vertical markets. The people who make sure that newsagents don't run out of copies of *PCW* carry Newtons. Doctors, traffic wardens and policemen in different parts of the world have all been issued with Messagepads.

To capitalise on this, the latest revision of the Newton OS has better links to the outside world. A package called Newton Press allows "books" of information to be compiled and downloaded into the Newton so that data can be quickly referenced.

Data can be stored and transferred using PCMCIA cards (although the two operating systems are only backward compatible) and you can fit standard modems and other PCMCIA cards.

Getting a mobile phone to work with a Newton, documentation errors notwithstanding, is fairly easy — you just need to master the software. This is where the dream of an easy-to-use machine falls flat: you need to read the manual from cover to cover; it's not an unpleasant experience but you have to get your head around the different terminology used by the Newton.

The Mac has a reputation for being the artist's machine — flamboyant and expensive but worth the extra. Many people will feel that the Newton reflects this. But the Newton hasn't been the success that Apple predicted. There has been no rush to implement the operating system on other platforms and despite newer models taking bigger batteries (the machine reviewed here takes four AAs while all the others in this group take two), you are still likely to be visiting the corner shop for batteries more often than with any of the other devices. In an attempt to ameliorate this, Apple has a desk stand which works like a mobile phone-charger, but it does look as though the machine Apple wanted to build was too ambitious.

PCW Details

Apple Newton Messagepad
Price £424
Contact Apple 0181 730 2048

Good Points Advanced technology…
Bad Points …at the expense of performance.
Conclusion Try before you buy.

Hewlett-Packard 200LX

The top name in calculators is Hewlett-Packard (Steve Jobs sold his HP calculator to finance the launch of Apple!). HP calculators have been to the moon, which makes the company's close-to-£500 asking price seem less exorbitant.

The machine is the familiar clamshell design and opens up to reveal a good screen. Seven application keys take you straight to any of the built-in programs. An eighth allows you to run the other programs you have loaded in.

This is an 80186-based DOS PC and while HP can justifiably claim that this is PC compatible, most people's definition of what constitutes a PC has changed over the years and this machine will not run Windows. Instead, it has its own multitasking system and those eight keys allow you to switch between tasks.

There is a PCMCIA type II slot which will take a full range of cards including modems, memory and even such exotica as GPS (Global Positioning Systems).

HP sees the major use as being for memory and sells a 40Mb RAM card which, with disk compression, provides 80Mb of storage. The 200LX has an infra-red port conforming to Irda (Infra-red data association). If you have a suitable printer, such as a LaserJet 5, you can print directly to it with no cables.

There is an incredible selection of programs with this machine. Even if you have quite a bizarre application you will probably find something, somewhere, to do the job. Remember that this is the kind of computer that was dominant between five and ten years ago.

There is a wide selection of standard programs: Pocket Quicken, an appointment book, phone book, file management program, a simple word processor (which HP calls a memo editor), applications manager and heavy-duty financial calculator. If that isn't enough to help you manage your finances, there is a full-blown version of Lotus 1-2-3 (Release 2.4). All are accessible with a single keypress.

With two presses you can get to a

comms program, stopwatch, database, note-take, cc:Mail, world time, a couple of games, some system programs and an MSDOS 5.0 prompt. To get software in and out of the computer, and to help with those all-important backups, there is a copy of Traveling Software's LapLink. If you stick to these programs, you have all the major bases covered. Although programs which are loaded in may not multitask correctly, they will still work.

Unlike the OmniGo 100, or the Sharp, this is one for the technically-minded. You need to know a bit about how a computer works to get the most from it. At one level you can use it as a simple organiser, and then it's the best of the bunch. On a second level it can be much more.

Price and the UK dominance of the Psion mean that dedicated software isn't as plentiful over here, but a little online trawling will turn up some great stuff. The supplied games are unexciting but you could, if the need arises, run Microsoft Flight Sim; once the great test of PC compatibility.

PCW Details

Hewlett-Packard 200LX
Price £399
Contact Hewlett-Packard 01344 360000

Good Points DOS compatible. Excellent build quality.
Bad Points Expensive.
Conclusion The "money's no object" option.

OmniGo 100

Smaller and squarer than its rivals, the cheapest Hewlett-Packard organiser is proof positive that you can still do something innovative within a budget.

The machine is small and feels cheap — the quality of plastic isn't as good as that used in the 200LX or the Psion. But behind the plastic lies a very smart machine.

The first thing to strike you is that this is two machines in one: it can either be used like the Psion, as a clamshell; or the screen can be folded back and written on with the stylus. This gives it a Windows-like interface which can easily be manipulated, although the small screen quickly becomes cluttered.

The OmniGo is exceptionally easy to use. There is an excellent selection of built-in software, including Pocket Quicken

which is a surprisingly powerful finance program. A version of Solitaire should placate anyone who has become hooked on the Windows version. But this is not a Windows machine. It runs GeoWorks, the simple operating system which seems to work better than PenWindows and uses a lot less hardware.

The handwriting recognition feature uses a system called Graffiti. This simplifies letter strokes to make it easier for the computer to recognise, but not to the extent that they are hard to learn. With the simple chart, available at the back of the manual, you can soon master the system and it's amazingly quick. You can keep up with note-taking, which is the real test, after only a couple of days' practice.

The pen, which initially seems gimmicky, works well. The calendar has a four-weekly view, to make monthly planning easier. The Calculator function models the extremely popular HP 12c scientific calculator, but the manual fights shy of explaining how to use it; instead recommending that you buy a separate book.

Once you have the system loaded with data there is the problem of extracting it. There is a simple serial connection

and suitable software built in but many people will favour the use of the SRAM option.

A standard PCMCIA SRAM card can be inserted and used as a backup medium, but beyond this, the PCMCIA slot is not much use — it won't cope with anything which needs more oomph, like flash RAM or smarter peripherals such as modems.

With a good range of pocket devices the OmniGo 100 is, according to HP, the best device to compare against the slightly more expensive Psion. This seems a little unfair since the Psion feels more upmarket.

Nevertheless, the Hewlett-Packard device is very tough. It is clearly not a techie device and is aimed at the mass-market. The documentation is excellent and includes details of a special magazine for OmniGo users: although this seems very American, it does indicate that the 100 is likely to be the first of a family.

PCW Details

OmniGo 100
Price £290
Contact Hewlett Packard 01344 360000

Good Points Exceptionally easy to use.
Bad Points Limited expansion.
Conclusion Less is more.

OmniGo 700

PCW EXCLUSIVE

Before you read this review you should take a look at the review of the HP 200LX (on page 125). The new OmniGo 700 is essentially the same machine, it has the same 80186 processor running at the same 8MHz and the same 2Mb RAM, but it has one very special extra feature: it has a holster on the top for a Nokia mobile phone. The device is the result of a joint venture between HP and Nokia, with the companies having worked closely together. The possibility of further versions in the future cannot be ruled out.

Most of what can be achieved with the OmniGo 700 can also be done with a 200 LX, Nokia data card and phone, but the piecemeal solution has some problems:

firstly, it means carrying around a number of bits and cables; and secondly, it's expensive. The data card costs around £450, not that the OmniGo 700 will be much cheaper — when it reaches the shops in April it will cost around £800. Hewlett-Packard justifies this by stating that it "allows every five minutes to become productive minutes".

A more sensible reason for buying the package (which HP sees as including the phone and airtime) is that it integrates the software and you don't have to be a techie to get it working.

The new software for the OmniGo 700 integrates under the 200LX system manager and so multitasks. You can use the phone while it is docked or pull it out. A special foot folds out to balance the computer when the lid is opened with the heavy phone in place.

The specific data applications include a simple terminal program, the same cc:Mail package which runs on the 200LX, and custom SMS software. SMS stands for Short Message Service. It's a system which allows you to send text of up to 160 characters from one GSM mobile phone to another. There are gateways which allow you to use a modem to send messages to people with mobile phones and some fledgling Internet servers. Most mobile phone companies use HP 9000 RISC servers as SMS gateways and HP sees a market for large, principally financial, institutions which want to link their office email to the phones of their executives who are travelling around the world.

To work overseas, the local mobile phone network must support data services. The OmniGo 700 was tested in France at HP's office in Grenoble, where the local networks are only just trialling data, and the results were unimpressive; attempts to log into the *PCW* cc:Mail post office failed. The places with good support for the system are the UK, Germany and Nordic countries.

SMS is a good system but doesn't have many users as yet. Most people will want fax. With the OmniGo 700, the executive on the move can send and receive faxes. It's possible to include PCX images in transmitted faxes but there is no OCR for incoming documents. It's more likely that people will receive faxes and print them out by beaming the page to an Irda-equipped printer.

The system has only about 30 hours of battery life, and the phone half that, so it's not envisaged that anyone will want to leave the system on to receive faxes; it's more likely that users will ask for a fax while speaking to someone and then slide the phone into the lid. Mobile phones have separate numbers for incoming data and fax so a new call would have to be made.

The Standard phone book application links to the mobile to send but it won't read and edit the SIM card information stored in the phone.

In addition to the software supplied, standard comms software such as KA9Q or DOSCIM can be used, since the card emulates a Hayes modem.

Several devices have been billed as "mobile communicators" but the OmniGo 700 is the first to have done the job.

PCW Details

OmniGo 700

Price £800 (estimated)

Contact Hewlett Packard 01344 36000

Good Points The ideal machine for the chairman of the board…

Bad Points …who is the only person who can afford it.

Conclusion The way ahead.

Psion 3a

Personal Computer World EDITOR'S CHOICE

The Psion 3a is not a new machine. It's been around for many years and was itself a progression, albeit an impressive one, on the Series 3. Newer models have doubled and quadrupled the amount of built-in RAM to 1Mb and 2Mb respectively, added a spellchecker and a Solitaire program. But these are just cosmetic changes to this stalwart of the PDA market.

Early machines suffered from production problems. They are just a faint memory now, but it says a lot for the machine that early customers were prepared to stick with it through teething problems. You won't find a more dedicated band than the modern Psion 3a owners.

The machine is a typical clamshell glasses-case style with an ingenious system which houses the batteries in the hinge. This allows the two halves of the machine to be thinner than the diameter of its two AA batteries. The screen has a 640 x 480 resolution with four levels of grey and the resolution is used to good effect. Most programs have a zoom feature which allows type to be scaled so that you can cram a lot into the small 135mm space when you need it, or read a crucial phone number quickly when on a train, say.

The standard machine has a basic Word-compatible word processor which, although rather limited, nevertheless copes with most of what you would be prepared to type using the 160mm keyboard. The feel of the keyboard is good and you soon get adept at typing with your thumbs, or

hunting and pecking. It's not suitable for touch-typing.

The spreadsheet is 1-2-3 compatible and will cope with large sheets, although the V30 CPU struggles a bit with some of the hairier calculations in a big sheet. The database is a simple flat file. Data is held as it is entered and edited, not sorted, but this is still reasonably quick. The fields are editable and only those which contain data are shown.

The diary program, or agenda, has a simple paper organiser display with options to show a week at a time, a full day with hourly timeslots, or a whole year. There is no monthly view and weeks always start on a Monday. There is an excellent "to-do" list system.

The operating system is multitasking and allows you to run as many applications as the memory limit allows. You should have no problems running the three main applications and a couple of minor ones like the excellent world clock and the calculator, simultaneously.

The world clock integrates with the phone numbers in the address book to calculate the dialling code for anywhere in the world. When you travel it will work out the new code when you change the home city. It will even tone dial the number for you using the built-in speaker. The speaker is also used to sound alarms and play back recorded sounds.

But what makes the Psion 3a really special is the huge quantity of software available for it. There is a built-in programming language called OPL (Organiser Programming Language). Psion has always had a policy of fostering software development. There is a plethora of games, improvements to the standard programs — including some excellent file management software — and good links to the PC and mobile phones.

PCW Details

Psion3a

Price £339.95

Contact Psion 0990 143050

Good Points Excellent performance. Wide choice of software.

Bad Points Proprietary RAM cards are expensive.

Conclusion The best, overall.

Sharp ZR-5000

The Sharp Wizard is probably the most popular personal organiser in the world. The latest incarnation, the ZR-5000 (sold in the US as the Zaurus) is a powerful and interesting machine. Build quality is excellent, it feels good and expensive.

There touch-sensitive screen has a display resolution of 320 x 240 but this isn't as useful as it might be because there is always a lot of decorative information displayed. You cannot zoom in as you can with the Psion.

There is only one model, which has 1Mb RAM leaving around 750Kb free for data. The two AA batteries give a quoted life of 60 hours but to reach this you will have to take it easy on the advanced features. These features include infra-red transmission conforming to two specifications: industry standard Irda and Sharp's own ASK.

A single, type II, PCMCIA slot allows the Sharp to use a number of different types of card. It is ostensibly not limited to SRAM like the OmniGo 100 but when you try to plug in an interesting card, a box on the screen warns you that the device cannot power the cards.

Sharp supplies a bigger external battery back but this is rather a naff solution as it's substantially bigger and heavier than the unit. The ZR-5000 can be used with a mobile phone but needs the extra power, and the Sharp phone (made by Ericsson) won't connect any faster than 2,400bps. A serial cable provides a simple link to a PC and there is a custom fax-modem.

As with the OmniGo 100, the pen serves to drive the user interface in place of a mouse, which would be impractical with a machine this small. Like the OmniGo, the ZR-5000 can take notes in an "ink-drawn" form but there is no attempt at handwriting recognition. In practice the screen is too small for either sensible note-taking or drawing. The pen allows you to highlight text for cutting and pasting and to operate the Windows-like scroll bars. The display is the best of the bunch: exceptionally crisp.

The links to a PC are exceptionally good, there is an infra-red connection, but for most people the best connection will be via the custom (i.e. expensive) serial cable. This is supplied with ZR Mail for Windows, a sophisticated program with good message management features and the ability to import and export a number of file formats.

These are ZDF (Zaurus format), CSV, SDF (like CSV but suitable for importing into dBase), TXT, a subset of RTF, BMP

and raw for files which are already stored in the PC format. All applications have an alternative to the ZDF format, although for the inked notes this is export only. In addition to the manipulation of files there is straight backup — one of the main reasons for storing things digitally.

The ZR-5000 benefits from its popularity but does not justify it. The hardware is excellent but the built-in software isn't as productive as the Psion's or as easy to use as the OmniGo 100's.

PCW Details

Sharp ZR-5000
Price £399
Contact Sharp 0161 205 2333

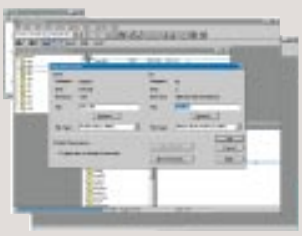
Good Points Elegant. Good screen.
Bad Points Fussy software.
Conclusion The oddball option.

Linking to a PC

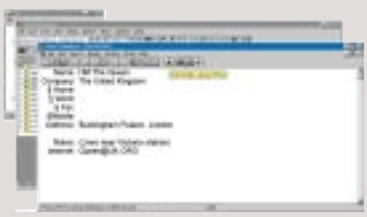
All six machines reviewed here offer the option of a PC link. The HP units offer versions of Traveling Software's LapLink for moving data between machines. The remainder offer custom programs which allow data to be moved and manipulated at the PC end. You connect the machines with a serial lead or via the Irda port. The principles involved in getting different machines to communicate are the same, so for the sake of convenience we'll look at how the Psion works. Psion supplies the PsiWin software which runs under Windows. You have to set it to use the right speed and serial port on the PC, and tell the Psion at what speed to run its serial port. Both work best at 19.2Kb/sec. With PsiWin you can run an incremental backup. The first time, the whole machine is backed up, but subsequently only the differences are transferred. An alternative is to use the file manager. This addresses the drives on the Psion and the host PC as if they were separate drives on the same system. You can drag and drop files from one to another. If you use Schedule+ in Office for Windows 95 you can exchange data with the Psion using third-party IntelliLink software and the cable supplied with PsiWin.

The file manager provides complete backup of the Psion including the disks which have been plugged in

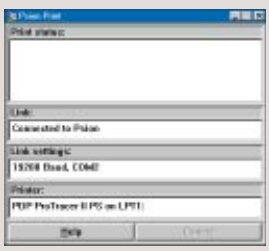
Dragging files across automatically triggers the conversion utility



A Windows-based version of the database program mimics the Psion software



The Print software lets the Psion use the PC's printer



Editor's Choice

Whichever machine you buy, you will end up with something better than paper and six holes. The Sharp ZR-5000 appeals for its build quality and excellent screen, but the software is not quite there. It does everything and looks good, but fails to make the most of the machine. Screens are often cluttered. This is the one to buy if you want something quick and simple which feels good.

If you don't worry too much about the feel, but care more about ease of use, the OmniGo 100 is excellent value for money. It's not as extendible as the others but works very well; the Graffiti handwriting system is especially good.

The top three are harder to separate. The Newton is a love it or hate it machine. You really need to use one for a few months (as is the case with most of them) to decide whether you want this personal assistant or another, but you need to take a risk. There are secondhand and ex-demo bargains which might be worth investigating before buying a more up-to-date model.

If you want something quicker, look at HP's OmniGo and the Psion. Both have ferociously dedicated owners. The price difference is an issue: for the extra £100 the HP gives you PCMCIA, Irda and DOS. All three allow better expansion but if the device is merely going to sit in your pocket, you don't need any of this.

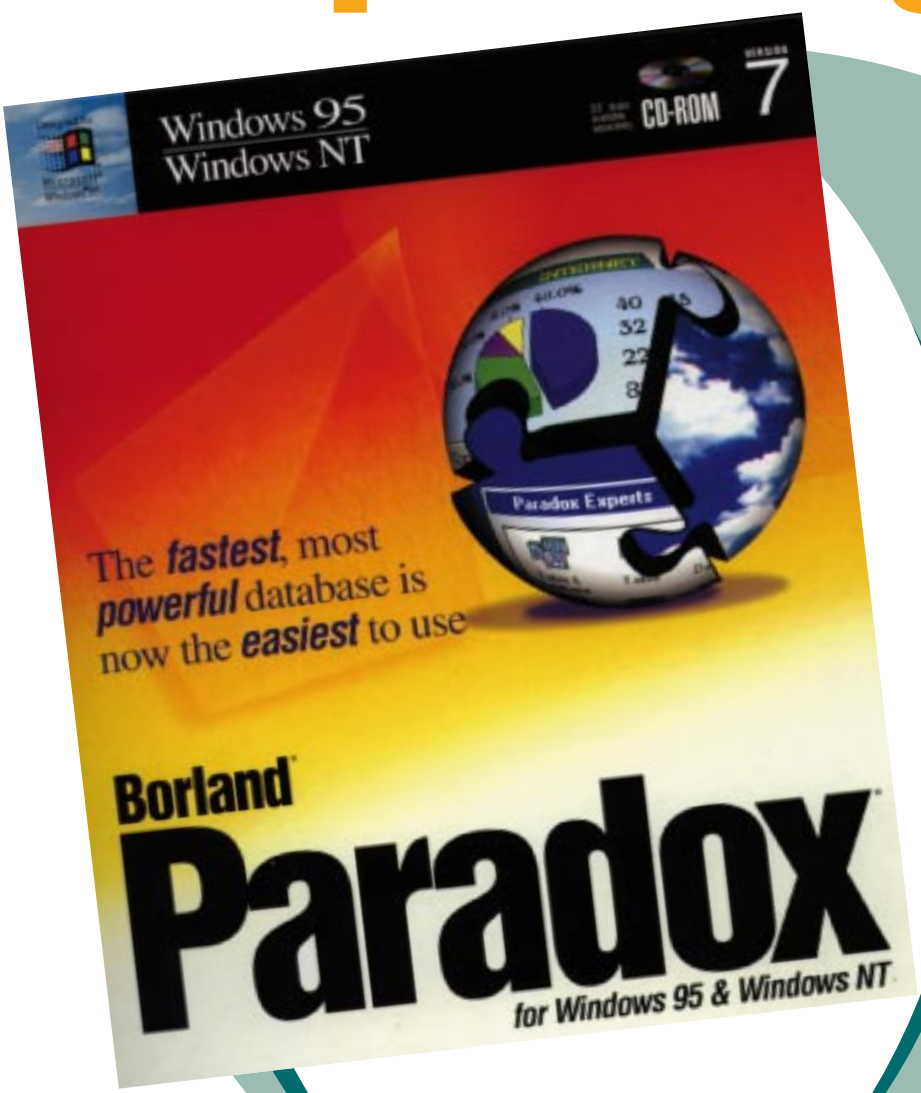
The OmniGo 700 is an amazing device, and for anyone with a Nokia 2110 or Orange mobile phone it's a great way to stay in touch — you could sit on the back of a motorbike and stay online! The technology is impressive, but then, so is the price.

When push comes to shove, it's the Psion that wins: good value for money, excellent software and support. Although the OmniGo was developed in Bristol, it is the 100 percent British PDA which takes the chequered flag.

TABLE OF FEATURES

Machine	Series 3a	ZR-5000	Newton	OminGo 100	200LX	OmniGo 700 (prototype)
Manufacturer	Psion	Sharp	Apple	Hewlett-Packard	Hewlett-Packard	Hewlett-Packard
Contact	0990 143050	0161 205 2333	0181 730 2048	01344 360000	01344 360000	01344 360000
Price (RRP)	£339.95	£399	£424	£290	£399	£800 (estimated)
Size (mm)	166 x 86 x 22	170 x 100 x 25.4	203.2 x 10.16 x 29	153 x 95 x 26	86.3 x 160 x 25.4	180 x 90 x 50
Processor	V30	Custom	ARM 610	80186	80186	80186
Weight	275g	385g	500g	311g	311g	392g
RAM	1Mb	1Mb	2Mb	1Mb	2Mb	2Mb
Screen resolution	480 x 160	320 x 240	320 x 240	240 x 240	640 x 200	640 x 200
Battery life (hours)	40	60	15	n/a	40	TBA
Storage option	Custom	PCMCIA	PCMCIA	PCMCIA	PCMCIA	PCMCIA

Paradoxically speaking



Borland's new Paradox 7.0 is a fully 32-bit desktop database. There are lots of new features for beginners as well as experienced developers.

DATABASE MANAGEMENT systems are slowly making their way on to the Windows 95 platform. Two months ago we saw the launch of Microsoft's Access 7.0; now Borland has responded with its own fully 32-bit version, Paradox 7.0.

For a long time Paradox was regarded as the best compromise between a power tool and an end-user application — a powerful and programmable RDBMS (relational database management system) as well as a good general-user tool for Windows. In fact, the name "Paradox" was coined to illustrate these supposedly conflicting characteristics. These days, the paradox is no longer unique to Paradox, and with this latest release of the product Borland faces some stiff competition.

Microsoft Access and Lotus Approach cater for a wide spectrum of users. More importantly, both packages are distributed as part of popular application suites, so in essence this means that many users, whether or not they realise it, already have database management software on their systems.

The major challenge for Borland has been to provide improvements which will satisfy Paradox's developer community, while at the same time making an application which is accessible to the average user.

This new version of the product has been injected with a whole load of easy-to-use interactive tools to benefit all types of users, from beginners to experienced database developers.

Cut to fit

Like every other major application built for Windows 95, Paradox has been well integrated into the new environment. The interesting thing about it, though, is the way that the interface has been tailored to blend in with Microsoft Office without destroying its integration with Novell's PerfectOffice.

All the toolbars are movable and dockable to create a familiar front-end for Office users, while the menu system has been greatly simplified, making all the

major functions easier to get at. More noticeable to regular Paradox users is that the Properties menu has disappeared and has been replaced with a Preferences tab dialogue box which is now an option on the Edit menu.

The Windows 95 look-and-feel is evident throughout the application. There's a healthy use of the right mouse button, and the File-Open dialogue box has been beefed up with major file operations such as renaming, copying, deleting and creating directories, which saves you having to switch over to the Windows 95 Explorer.

The Help facility has been injected with some Windows 95 look-and-feel, too. Button descriptions pop up automatically on the toolbars and a search facility is built in to a tabbed dialogue box so that you can find help on any subject, as well as browse through a book-style table of contents. The increased volume of online help in Windows 95 applications is a real boon when it comes to using complex software; in this version of Paradox the help system is comprehensive and well designed. With context-sensitive information always at hand, I found it easy to put together simple applications without constantly having to look things up in the manuals.

Call in the Experts

For novice users, all kinds of Experts (the equivalent to Microsoft's Wizards) have been dotted around to help you get to work quickly.

There's a Quick Start Expert which appears automatically on loading and is additionally available from the Tools menu. This offers a selection of database templates divided into business and personal categories. Select one of them, and a database will be created with all the forms, tables and reports you're ever likely to need.

This is a useful tool for new users as it lets them create fully-fledged working applications straight away, without having to study database theory or ObjectPal. But the selection is rather limited, with a choice of just four databases in each category. By contrast, Microsoft Access has 22 different solutions to choose from.

Other Experts to hold your hand during various tasks include a Chart Expert which gives you a step-by-step guide to creating graphical views of your data, supporting 18 different types of graph. There's a Table Expert which guides you through the design and creation of tables, and a Label Expert containing a whole selection of label specifications.

One of the most impressive new additions in this version is the Mail Merge Expert, which provides excellent integration with Microsoft Word and WordPerfect. The process is simple and painless. It's all controlled by a series of dialogue boxes which ask you to specify the data file you wish to use, the fields you want to include and how you want to sort. I tested this with Word and found the results impressive, producing 50 custom letters in no time at all.

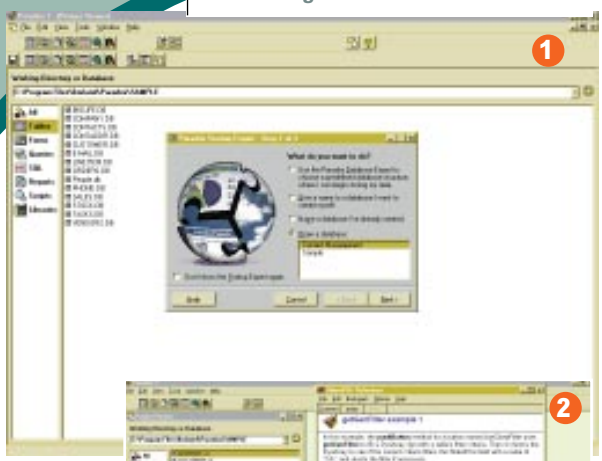
Object of the exercise

For developers, there are improvements like the Object Explorer which replaces the Object Tree from version 5.0. This allows you to inspect methods, events and properties, all in a hierarchical tree arranged in a tabbed Window. This is a definite boon when it comes to keeping track of the code in your application. Visual icons are used for different types of object so that you can view and scroll your code more easily. The interface is, unsurprisingly, rather Delphi-like in design, and it works well in Paradox where there's always been a strong commitment to object-based code.

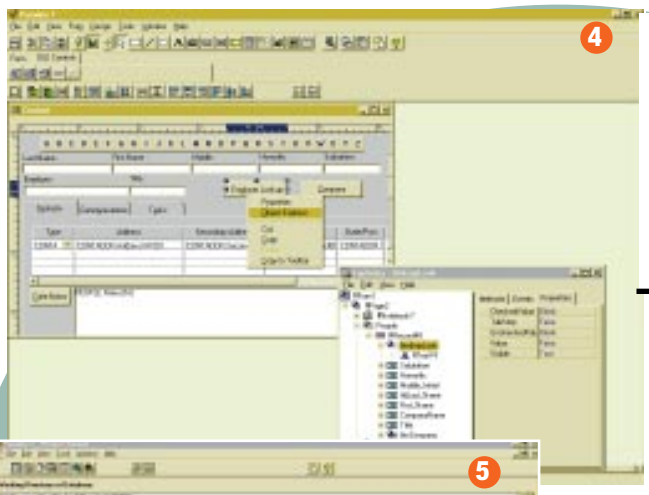
The Object Explorer is easily accessible from the form designer using the right mouse button. Simply right-click on an object and a menu appears with access to the Properties dialogue box or the Object Explorer, showing the relevant methods and events for that object.

There's also a revamped Import Expert for taking in ASCII files in fixed length or delimited forms. This gives you the choice of creating a new file, appending to the existing one, or

(1) *This is Paradox 7.0's opening screen: useful for first timers but potentially annoying for experienced users, so there is an option to disable it*
(2) *Online help makes all sorts of tasks easier in Paradox — including programming. Here, a snippet of example code shows how to use the command getGenFilter*



(3) *The Mailmerge expert gives excellent integration with Microsoft Word, even allowing you to format the data in each field*



(4) *The Object Explorer displays the properties of a button on a form. The new icons show you at a glance the type of object at which you're looking*

(5) *The Import Expert succeeds in making data easier to handle by taking you through the procedure, step by step*

overwriting a file. This is a useful tool both for developers and novice users, although I found the import process to be slow on our benchmark tests.

This version of Paradox supports OLE 2.0, allowing developers to extend the power of the product by incorporating 16-bit or 32-bit OCX controls. There's also a selection of built-in controls to add functionality to custom-built apps. New Tab dialogues, for instance, allow Paradox applications to maintain their consistency with the Windows 95 environment. There are new-style List boxes, combo boxes, and a progress and track bar.

Conclusion

There's a bit of a competition going on with Experts and Wizards at the moment, and despite the impressive collection included in this version of Paradox, there are still a few areas which could be improved.

It would make more sense, for instance, if the database templates were available under File-New in the same way that the Form Expert is available under Form-New. Instead, you have to go to the Expert's separate menu option under Tools.

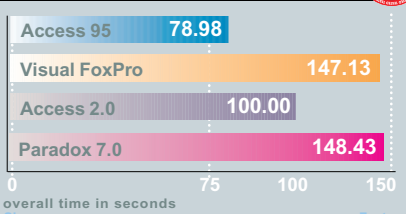
If Paradox is attempting to appeal to a large novice user-base then Borland still has some hard work to do, especially when you consider that many users (whether they know it or not) already have Access 95 on their systems as part of the Microsoft Office Suite. For beginners, Access has many more sophisticated tools on offer: the Table Analyzer, for instance, which converts flat files to relational databases; and the Performance Analyzer, which recommends ways of speeding up your system and even implements them, automatically.

On the plus side, Paradox 7.0 offers some excellent improvements in its development tools over version 5.0 and the simplified menu system makes the product far easier to navigate. It requires a minimum of 8Mb to run in Windows 95 compared with Access's 12Mb, and for many users this may prove crucial. There's a difference of £100 between the Standard and Professional versions of Microsoft Office and Paradox 7.0 fills the price gap nicely at just £99.

To tip the balance further in its favour, Paradox wins hands down on performance, producing an overall score which is more than twice that achieved by Access. For the more discerning database user, this may well prove to be the deciding factor.

Eleanor Turton-Hill

Performance results



Relative throughput (compared to Access 2.0)

Moving your application to Windows 95 or Windows NT

There's more to Paradox 7.0 than a few cosmetic changes in the interface. It's a fully 32-bit application designed for building 32-bit apps in Windows 95 and Windows NT.

When it comes to moving applications from Windows 3.1 most of them, built in version 5.0, will run unchanged in version 7.0: the crucial word here is "most". The vast majority of applications can simply be recompiled in version 7.0, but as with any piece of code being transferred to the Windows 95 or NT environments, there are a few cases where a simple recompile will not do the job.

Direct calls to the Windows API, for example, will cause problems as many of the API calls in Windows 95 have been changed or renamed. Window handles, for instance, in Windows 3.1 are 16-bit integers, while in Windows 95 and NT they are 32-bit integers. Calls made to third-party DLLs will also cause problems — you'll have to find the new 32-bit version to get your app to work under the new OS.

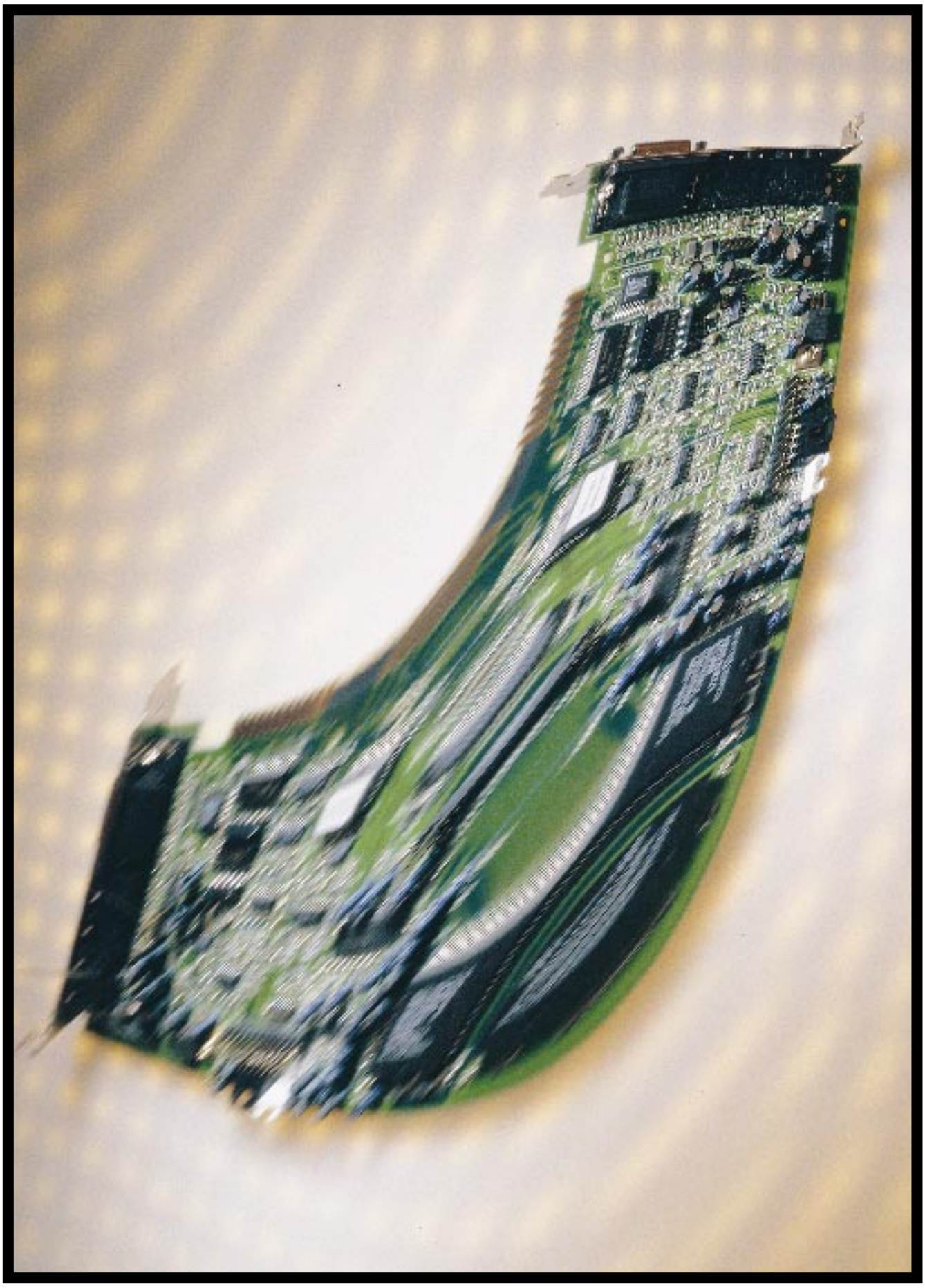
There are other alterations you may have to make which are specific to Paradox. In Paradox 5.0, for example, applications are attached to menus by adding an entry to the PXDLITE.INI file. Under Windows 95 and NT, there is no such startup file. Instead, this information is stored in the Registry database. In version 7.0 you can access information in the Registry by using a suite of new methods provided for this purpose.

Any version 5.0 applications which use OBEX will also require conversion, as Paradox 7.0 now uses MAPI as its messaging standard. For developers, there are now 23 new methods which provide complete access to MAPI mail.

When you do come to moving your Paradox 5.0 applications to Paradox 7.0, you may need to work in a mixed OS environment for a while. Applications developed in version 5.0 can be recompiled to run in version 7.0, but surprisingly this process can work in reverse, too. Version 7.0 apps can be recompiled to work in version 5.0 — useful but not highly recommended since Paradox 7.0 features are not supported by previous versions.

PCW Details

Price £99
Contact Borland 01734 320022



sound effects

Lend your ears to a selection of sound cards, from the cheap, to the cheerful, to the cost-a-wad.

WHEN THE PC WAS FIRST designed, no-one really thought about sound. The original IBM-compatible PC was built as a business tool, not as a multimedia machine, so it's hardly surprising that the inclusion of a dedicated sound chip in its architecture was not considered. Computers, after all, were seen as calculating machines; the only kind of sounds necessary were the beeps that served as warning signals.

For years, the Macintosh has had built-in sound capabilities far beyond the realm of beeps and clicks, yet even now, PCs with integrated sound are few and far between. That's why they still require an add-in board or sound card in order to produce decent noises. The popularity of multimedia over the past few years has accelerated the development of the sound card, and the increased competition between manufacturers has made these cards more sophisticated while at the same time bringing the price down.

These days, the vast majority of PCs come with a sound card pre-installed, but the quality of the card you find in your system is extremely variable. In such a price-sensitive market, the sound card is often the first budgetary victim, so many users unwittingly end up with a second-rate product in their system. As a result, there's a growing market in sound cards and upgrades for them.

Here, we've gathered up a selection of 12 sound cards currently available on the market, with prices ranging from £26 to more than £200. Most of them have Wavetable technology; this uses sampled sounds of real instruments and has made a massive improvement to the quality of sound available to your PC when compared with the synthesised efforts of a few years ago.

DSP (Digital Signal Processing) technology is also becoming more widespread in sound cards, enabling reverb, delay, and other effects to be applied to instruments or samples.

Another major technology change has been the introduction of Plug and Play. Of the 12 cards reviewed, half claim to conform to the Plug and Play standard. Windows 95 includes drivers for a large number of sound cards and should automatically detect Plug and Play cards on installation. The OS reads your config.sys and system.ini files, scanning for existing driver installation. If the card's drivers are pre-bundled with the OS, they'll be installed and configured for you. If not, you'll be prompted for an installation disk.

The non-Plug and Play cards featured in this review must be installed manually, using the Add New Hardware Wizard in Windows 95.

As with many new Plug and Play devices, the concept of seamless integration does not always find its way into reality, and here we've tested each card for its degree of compatibility with the new OS.

PCW SOUND CARD Photography by David *Whyte*

Sound Cards Contents

Once installed, we've additionally assessed each card on a variety of other factors, including the quality of on-board samples, recording capabilities, upgradability, and supported standards.

For the more discerning PC user, sound quality is generally the deciding factor, and it's amazing just how much variation we've found between the cards reviewed here.

Eleanor Turton-Hill

16-bit AudioStar WAVE

This half-sized card installed with no problems, although the procedure is not obvious due to scanty documentation. Once you realise that it uses an ESS chip, it's all plain sailing. In Windows 95, all you do is select the ESS Technology driver from the list in the Add New Hardware Wizard, and you're ready to go.

The Wavetable synth is a tiny daughterboard perched on top of the card, containing 512Kb of sampled instruments. It holds 128 sounds and seven drum kits with 32-voice polyphony, and provides General Midi and Roland's GS compatibility as well as MT32 emulation by means of patch mapping. The board itself also provides compatibility with SoundBlaster and Ad-Lib using the OPL3 chip and there are CD-ROM connections for Mitsumi, Panasonic and Sony, although the audio connector for Mitsumi is slightly obscured by the daughterboard, which could be a problem.

This card will record and play back in 16-bit stereo with sampling rates up to 44.1kHz. The Wavetable sounds included do not really live up to the "unbelievable audio experience" described on the box, but do offer surprisingly good quality.

There are various bundled Windows utilities with this card for recording, editing and mixing, as well as Steinberg's Music Station, a MIDI sequencer with score printing and auto-styles.

Eleanor Turton-Hill

PCW Details

16-bit AudioStar WAVE
Price £93.61
Contact Terratec Electronics UK 0181 946 9922

Good Points Good Wavetable synth.
Bad Points Minimalist documentation.
Conclusion Good, all-round deal.

Aztech Sound Galaxy Waverider Pro 32 3D

Aztech's half-size card is a cheap all-round multimedia card with a leaning towards games. It comes with a 1Mb Wavetable synthesiser containing 128 instrumental sounds and 69 drum sounds, and is compatible with General MIDI and Roland's MT-32 and MPU 401. Backward compatibility with Ad-Lib and SoundBlaster is provided by Yamaha's OPL3 FM chipset, and there's a standard IDE interface for connection to a CD-ROM. There's no feature connector for upgrading the Wavetable synth, but the on-board sounds are reasonable. The MIDI port doubles as a games port, providing a connection to a standard PC joystick.

Aztech is keen to market the Waverider's 3D sound capabilities. This audio technology, or "spatial audio", exploits the ability of the human ear to discern the location of sound in space; the effect is impressive, especially on movie soundtracks and video games.

Installation in Windows 3.1 went smoothly, but in Windows 95 the Waverider caused a few configuration headaches. Sampling rates range from 4kHz to 48kHz, but I would not recommend this card for high-end audio applications as the signal-to-noise ratio is poor. Minimalist headphones are provided along with a few basic applications including AudioStation, VideoStation, and an audio mixer utility.

Eleanor Turton-Hill

PCW Details

Aztech Sound Galaxy Waverider Pro 32 3D
Price £79
Contact Aztech 01734 814121

Good Points Good games and basic multimedia card.
Bad Points Difficult installation for Windows 95.
Conclusion A good deal for the price.

SoundBlaster AWE-32 PnP

Creative Labs has updated its original top-end AWE-32, with plug'n'play facilities and Windows 95 software. Otherwise, it's the same full-length card with a load of interfaces including IDE and two audio inputs for a CD-ROM drive, and a daughterboard connector.

The 512Kb memory, which may be expanded (and, sadly, sacrificed at the same time) with a pair of 30-pin SIMMs, up to a maximum of 28Mb. This allows you to download samples and use the AWE-32 as a MIDI sampler.

An SPDIF jumper supplies unconverted digital audio suitable for an external hi-fi digital-to-analogue converter, offering a much cleaner and quieter sound than the AWE's onboard DACs. Only the synth sounds are fed through this jumper, not the wave audio channel.

One megabyte of WaveTable samples offer 32-note polyphony in 16 parts, compliant with the General MIDI standard. They are bettered by some, but can be upgraded with a daughterboard or by downloading your own. The card is SoundBlaster 16 compatible.

Installation drivers are supplied on the standard Win95 CD, and there's a large range of excellent software utilities and applications.

For features, flexibility and expansion possibilities, the AWE-32, in its PnP guise, remains a clear winner.

Gordon Laing

PCW Details

SoundBlaster AWE-32 PnP
Price £199
Contact Creative Labs 01245 265265

Good Points Sampling memory. Digital output. Does everything.
Bad Points Plain gamers may survive with a lesser, cheaper card.
Conclusion Ultimately flexible all-rounder.

SoundBlaster 32 PnP

Creative Labs has a whole family of 32 cards. This SoundBlaster 32 PnP is a cut-down version of the AWE-32 and is around £50 cheaper. It comes with a 1Mb Wavetable synthesiser with GM sound samples and is compatible with MPU401 and Roland's MT-32 and GS. The on-board synth is based on the EMU8000 from EM-u Systems (a subsidiary of Creative Labs) which is sounding a little out of date: percussion instruments seem thin and bass sounds lack depth.

Two 30-pin SIMM sockets on the board can provide the EMU8000 with additional sample memory up to 28Mb. Once installed, you can use the card as a MIDI sampler, in which case Creative's SoundFont technology allows you add your own sounds with real-time panning, reverb and chorus. These sounds are also output from a jumper in raw digital SPDIF format — connect this to an external hi-fi DAC for superior sound quality (see our AWE-32 review opposite).

This card turned out to be the perfect example of plug and play. Windows 95 identified it correctly on bootup, prompted me for the Win95 installation CD, sucked in the appropriate driver and was ready to go. The SB32 is capable of recording and playing back 16-bit audio at 44.1kHz and is supplied with several Windows applications, including Creative Wavestudio for editing and mixing wave files.

Eleanor Turton-Hill

PCW Details

SoundBlaster 32 PnP
Price £130 (estimated street price)
Contact Creative Labs (pre-sales) 01245 265265

Good Points Excellent Win 95 compatibility.
Bad Points Weak WaveTable samples and no feature connector for upgrading.
Conclusion Good choice for all-round software compatibility.

miroSound PCM20 Radio

Radio? Yes, that's right: there's a radio tuner on this card. For those of you who want to pay an extra £80 for the luxury of having a radio built in to your PC, look no further.

The PCM20 is basically a PCM12 with a tuner bolted on. But the cost of getting Radio 1 is the loss of on-card proprietary CD-ROM interfaces; only an EIDE CD-ROM interface remains.

However, this 16-bit full-length card still includes WaveBlaster daughterboard, line in, line out and CD-ROM audio interfaces on the card. Like the PCM12, it carries the Yamaha OPL3 and OPL4 chips for FM synthesis and processing.

There are 24 WaveTable voices contained in 2Mb of ROM. The sound quality on both MIDI and wave file playback wasn't disappointing and, unlike the PCM12, we managed to get General MIDI music effects when we ran Doom2.

miro has also managed to squeeze an impressive six external connections (mic, line in, line out, MIDI/joystick, MIDI device and antenna) onto the blanking plate.

The radio actually works but make sure you have the antenna properly placed for good reception. The software bundle is the same as the PCM12's except for the radio tuner interface.

Installing the drivers was easy and even though they're for Windows 3.11, they worked under Windows 95. Expect Windows 95 drivers this month.

Dylan Armbrust

PCW Details

miroSound PCM20 Radio
Price £225
Contact Miro 01494 510250

Good Points Easy installation.
Bad Points Too expensive for what it offers.
Conclusion Good sound; but do you really need a radio on your PC?

miroSound PCM12

This little number was a bit of a disappointment. Not because it didn't work properly, but because it didn't give us the "Top-quality mega sound" it said it would. The PCM12 claims plug and play but due to a lack of Windows 95 drivers this wasn't the case. miro has stated that Win 95 drivers should be ready this month.

The full length 16-bit sound card has a respectable sampling range up to 48kHz. It comes bundled with a Cubase Lite MIDI sequencer, Sound Forge sound editor, and HQ-9000 CD-player. There are a multitude of interfaces which make this card flexible in use. It accommodates Sony, Panasonic, Mitsumi and standard IDE CD-ROM drive data interfaces as well as on-card connectors for line in, line out, auxiliary, and CD-ROM audio. You can add a WaveBlaster daughterboard to upgrade your sound samples.

With 24 WaveTable voices in 2Mb of ROM the PCM12 doesn't quite come within the range of the high-end cards, although wavefile playback was respectable. The same applied to the MIDI files, except when running Doom 2 or Descent. We just couldn't get the games to play back in General MIDI; only FM sound was possible. This was due, however, to our having run Windows 95 on Windows 3.11 drivers. The PCM12 is also SoundBlaster and Ad-Lib compatible.

Dylan Armbrust

PCW Details

MiroSound PCM12
Price £145
Contact Miro 01494 510250

Good Points Reasonable sound and lots of CD interfaces.
Bad Points Not Windows 95 plug and play, yet.
Conclusion An average sound card.

Orchid NuSound PnP

Orchid was one of the first on the scene with a plug and play sound card. Its NuSound PnP is a half-length card with IDE and Panasonic CD-ROM drive interfaces, and a choice of two CD audio input sockets. NuSound samples from two to 48kHz in 8- or 16-bit.

The NuSound is compatible with Ad-Lib, SoundBlaster (and Pro), Windows Sound System, and General MIDI, the latter catered for by 343 samples compressed into 1Mb of WaveTable ROM. It's not up to the level of the Roland, Turtle Beach or Yamaha samples, but is much better than the rest, including Creative's. A WaveTable daughterboard interface is fitted in case you want better still.

A unique optional extra among the cards tested here is the NuPanel interface, duplicating the NuSound's blanking plate audio jacks and additionally offering volume control and buttons to mute and defeat the 3D Spatialiser sound. The NuPanel fits in a 3.25in drive bay and costs £21.27. Cheap, yes, but why didn't Orchid throw it in for free?

Plug and play installation was fine. Bundled software includes a MIDI sequencer, a digital audio editing utility and a variety of audio compression modes.

The NuSound PnP certainly sounds good, with low noise levels, high sampling rates and above average WaveTable samples. There are lots of expansion options, too.

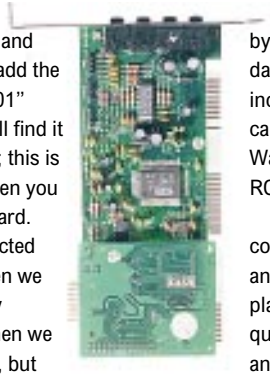
Gordon Laing

PCW Details

Orchid NuSound PnP
Price £129
Contact Orchid Europe 01256 479898

Good Points Good WaveTable samples. NuPanel option.
Bad Points NuPanel isn't free.
Conclusion Good all-round performer. Recommended.

Pine PT201



Can you say plug and play? Now try to add the words "Pine PT201" before it and you'll find it just doesn't work; this is what happens when you try to install the card. Windows 95 detected the card only when we selected Add New Hardware, not when we started up the PC, but what can you expect for £29.99?

The PT201 is a small, half-length 16-bit card that comes with the standard line in, line out, speaker and mic inputs but lacks the finesse of a games port on the same plate. Instead, it's connected via a ribbon cable to another blanking plate.

This card a bit on the lean side. It does have a CD-ROM audio connector for Sony, Mitsumi, and Panasonic; the sampling range goes from 8kHz to 44.1kHz, but the card itself doesn't include WaveTable memory. This is accomplished (for an extra £35.99) by the PT202 Vivaldi daughterboard which was included with our review card; it is capable of 32 WaveTable voices on 1Mb of ROM.

SoundBlaster compatibility gave us sound and music effects when playing Doom2, but the quality wasn't outstanding and there's no General MIDI without the daughterboard. The software provided was a basic AudioRack giving CD playback, audio recording and so on.

Dylan Armbrust

PCW Details

Pine PT201
Price £29.99 (incl VAT); plus £35.99 (excl VAT) for the PT202 wave table daughterboard
Contact Pine 01908 218812

Good Points It produces sound and it's cheap.
Bad Points It's not plug and play, and it's cheap.
Conclusion Cheap but functional.

The history of sound generation

To understand how sound cards have developed over the last ten years, a basic understanding of the physics of sound is needed.

What is sound, exactly? Sound is produced when two or more objects collide, releasing a wave of energy which in turn forces changes in air pressure around us. These changes in pressure are received by our eardrums, and our brain interprets them as sound. Sound waves move in all directions from the disturbance, like the ripples produced when a stone is dropped into a pond.

When sound is recorded through a microphone, the changes in air pressure cause the diaphragm to move in a similar way to that of the eardrum. These minute movements are then converted into changes in voltage.

Essentially, all sound cards produce sound in this way, only in reverse. They create, or play back, sound waves. The changes in voltage are then amplified, causing the loudspeaker to vibrate. These vibrations cause changes in air pressure which are further interpreted as sound.

● Frequency Modulation

The first widespread technology to be used in sound cards was Frequency Modulation, or FM, which was developed at a British university in the early seventies by Dr John Chowning. It was Yamaha, however, which later researched and developed Chowning's theory.

The first FM synthesiser to reach these shores was the legendary DX7. It made a huge impact on the music industry since it produced "unbelievably real" sounds that had never before been heard.

It wasn't long before FM technology was integrated into sound cards. It provided a sound source for MIDI-based music which later became known as Ad-Lib. By combining MIDI and sampled-based audio (the SoundBlaster part), sound cards became capable of producing a wide range of musical textures.

● How FM works

FM creates sound by fusing together two or more simple waveforms known as carriers and modulators. When the waveforms are close in frequency, complex waveforms can be produced to simulate real instruments. Greater realism is achieved by mixing a wide range of waveforms.

However, if you study the waveform produced by a piano, it would be far too complex for an FM generator to reproduce accurately. The same is true for many other instruments and this is why FM cards do not sound realistic when compared with newer, WaveTable-based sound cards.

● WaveTable synthesis

WaveTable cards don't generate waveforms, they play back pre-recorded samples of real instruments. A WaveTable ROM is thus an electronic table of waveforms. Whereas one FM sound card will sound much the same as the next, WaveTable cards differ significantly in quality.

The quality of its instruments is determined by several factors: the quality of the original recording of each instrument; the sampling rate, or frequency of the recordings; the number of samples used to reproduce each instrument; and the compression methods used to store the samples.

By using high ratio compression techniques, more samples, or instruments, can be "squeezed" into small amounts of ROM. There is a trade-off with quality, however, since compression often results in loss of dynamic range and quality.

Every instrument produces subtly different timbres depending on how it is played. For example, when a piano is played softly, you don't hear the hammers hitting the strings. When it's played harder, not only does this become more apparent, but there are changes in tone as well.

To recreate this accurately with a synthesiser, many samples and variations have to be recorded for each instrument. Inevitably, more samples require more ROM. A typical sound card may contain up to 700 instrument samples within four megabytes of ROM. But to accurately reproduce a piano sound alone, you're realistically looking at between 6Mb and 10Mb of data. This is why there is no comparison with the real thing.

● Digital effects

Digital effects can dramatically improve the overall quality of sound cards. Digital Signal Processors (DSPs) use complex algorithms to add reverb and other effects to give the impression that instruments are being played in large concert halls. Other popular effects include stereo choruses and delays.

Adding a stereo delay to a guitar part can "thicken" the texture and give it a spacious stereo presence. "Chorus" is used to thicken instruments as well, and gives the impression that many instruments are playing when in fact there's only one.

● General MIDI

General MIDI (GM) gives no indication as to the audio quality of a sound card. It simply defines a minimum specification for synthesisers. It also describes a standard set of sounds and their location in terms of patches, or programmes.

With a general MIDI-compatible synthesiser, you hear what the composer intended — a piece written for violin, cello and piano, for instance, will be played back on the correct instruments. Before GM was implemented, you might have heard a trumpet, guitar and saxophone because there were no standards governing where specific sounds should be stored.

Steven Helstrip

Reveal WaveExtreme 32

This half-size card worked perfectly under Windows 3.1, but the Windows 95 installation was fraught with difficulty. The packaging claims Win95 compatibility but we only got it working after several hours of angst. Once down to business, however, this card offers a reasonable array of functions for your money.

You get a 1Mb WaveTable synth containing 32 voices and compatibility with General MIDI and Roland MPU401, as well as backward compatibility with SoundBlaster and Ad-Lib. It's also compatible with Sony, Mitsumi and Panasonic CD-ROM drives. The WaveTable samples are not among the best I've heard and there's no feature connector for upgrading. For most applications, however, the on-board sounds should be fine.

The WaveExtreme 32 is capable of recording and playing back in 16-bit stereo with sampling rates from 4kHz to 44.1kHz. Several sound-editing programs are bundled, including AudioStation and Midi Orchestra, as well as tools for enhancing multimedia presentations. Although impressive for the price, this card is really a cut-down version of its more substantial sibling, the WaveExtreme Pro, which has RAM sockets for expansion up to 16Mb as well as a selection of special effects such as real-time reverb and chorus. The £99 Pro version gives you a more fully-functioned and versatile product.

Eleanor Turton-Hill

PCW Details

Reveal WaveExtreme 32
Price £79
Contact Reveal 0181 845 7400

Good Points Great compatibility.
Bad Points Difficult installation under Windows 95.
Conclusion A reasonable deal.

Roland SCM-15AT

There are two parts to Roland's SCM-15AT. The MPU-401AT board is nothing more than a short, 8-bit card offering MPU-401 MIDI compatibility and a WaveTable daughterboard connector. No SoundBlaster or Windows Sound System compatibility — just MIDI. On its blanking plate are a pair of RCA phono jacks for line stereo out, stereo headphone socket, and a pair of mini sockets for MIDI in and out; supplied cables end in proper 5-pin DIN MIDI sockets.

The second part is a Roland SoundCanvas SCB-55 (SCD-15) daughterboard offering 354 wave-sampled instruments, 184 drum and percussion sounds, and on-board DSP reverb and chorus effects. The card is 28-voice polyphonic up to 16 parts, and conforms to General MIDI System Level 1 and Roland's own GS format. Bundled software caters for the sequencing and playback demands of beginners through to high-end users.

There's no mention of Windows 95 or PNP, but the card worked fine on this platform.

Roland's package includes GM music for games but is targeted primarily at the Windows MIDI music makers. They will not be disappointed by the quality, but may find the lack of SoundBlaster compatibility and digital recording facilities rather limiting.

Gordon Laing

PCW Details

Roland SCM-15AT
Price £345
Contact Roland UK 01792 702701

Good Points SCB-55 daughterboard sounds great.
Bad Points Expensive. No SoundBlaster or digital recording facilities.
Conclusion Package suitable for wealthy Windows MIDI musicians only.

Turtle Beach TBS-2000

Otherwise known as the "32-Voice Wavetable Sound Card", the TBS-2000 is something of a marketing departure for Turtle Beach. Previously known for its specialised hi-fidelity recording and playback products, the company has sensibly released a card for the discerning mainstream user. The company hasn't compromised the design of the TBS-2000, though. Its 2Mb of general, MIDI-compatible WaveTable samples are among the best-sounding here. Audio recording and playback specs are high, too, so those interested in quality wave editing and production should look no further. Sampling rates of between four and 48kHz, at 8- or 16-bit, are available.

The half-length card has a single IDE CD-ROM interface and CD audio input socket but no daughterboard connector — at least the built-in WaveTable sounds are good. Top of the labelled features is Windows 95 plug'n'play compatibility and installation under this platform is as easy as any other PnP sound card, except that we had to change some of the SoundBlaster default settings when running DOS outside of a DOS window. Bundled software includes Wave SE for digital audio and Stratos for MIDI sequencing.

The TBS-2000 may not boast the flexibility and support of Creative's AWE-32, but it sounds better and is a bit cheaper.

Gordon Laing

PCW Details

Turtle Beach TBS-2000
Price £143
Et Cetera 01706 219999

Good Points High-quality sound in all modes.
Bad Points No SIMM sample banks.
Conclusion Great all-rounder. Highly recommended.

Yamaha Sound Edge SW20-PC

The Sound Edge is designed "for Windows 3.1" and it worked happily on our 3.1 machine, but Windows 95 wasn't interested in the supplied 3.1 disks; you'll need to contact your supplier for the 95 drivers. The 2Mb of WaveTable samples were the best we'd heard outside of a high-end daughterboard; indeed, the only samples to beat this are to be found on Yamaha's own superb DB50 XG daughterboard.

Under Doom and Descent the SoundBlaster sounds were very good, but there are known problems with other DOS games. This card might be best avoided if you're predominantly a games player.

The three-quarter length card is fairly well equipped with Sony, Mitsumi and Panasonic CD-ROM interfaces, along with their respective three audio input connectors. These, however, show their age since CD-ROM drives have just about standardised on the IDE interface. There's no daughterboard option either, although the Sound Edge hardly needs one.

The Sound Edge is clearly targeted at the Windows MIDI sequencing market, and while its WaveTable sounds are good, a far more flexible, better-sounding and only slightly more expensive solution would be to buy Yamaha's daughterboard and stick it on an ordinary games card.

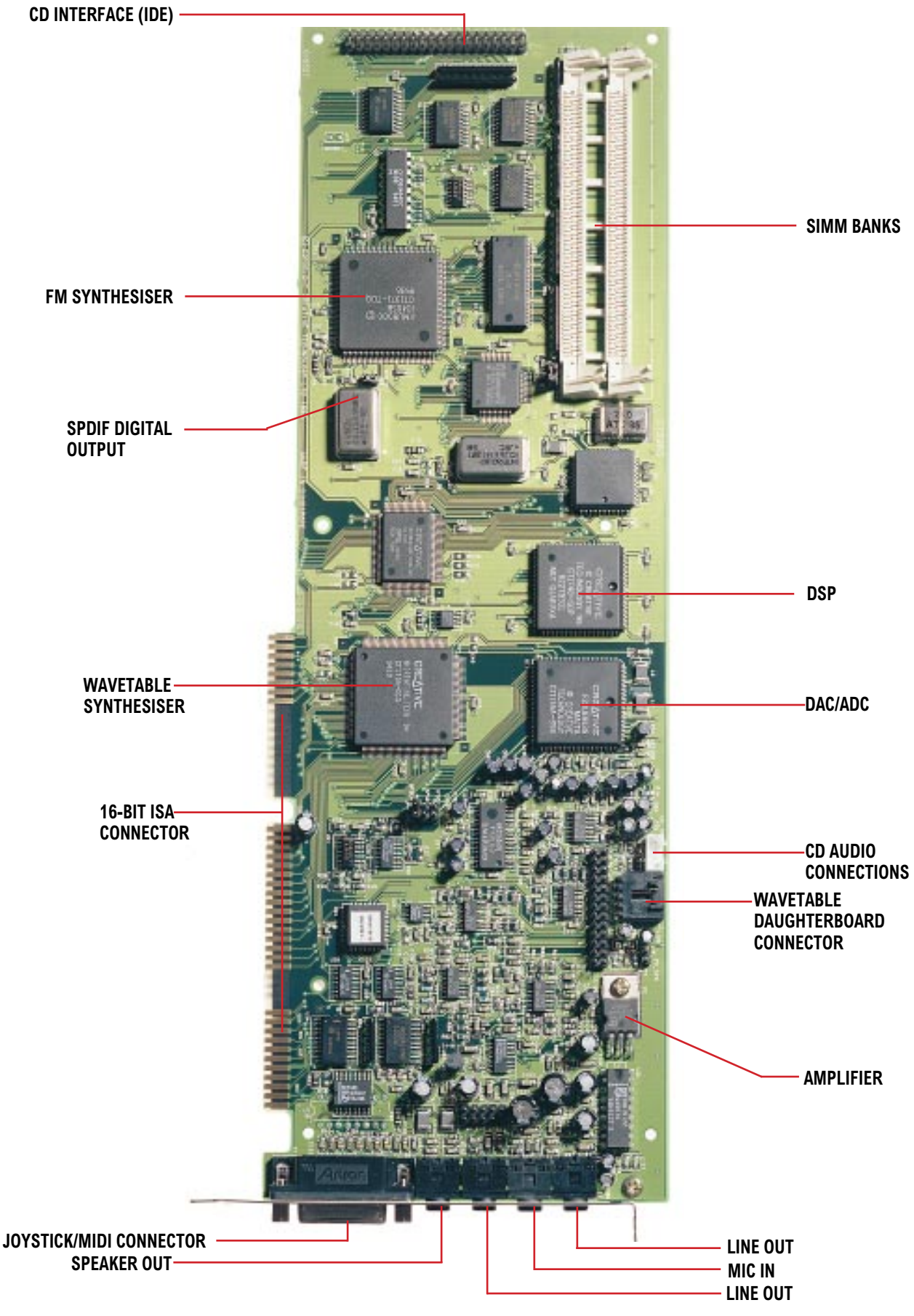
Gordon Laing

PCW Details

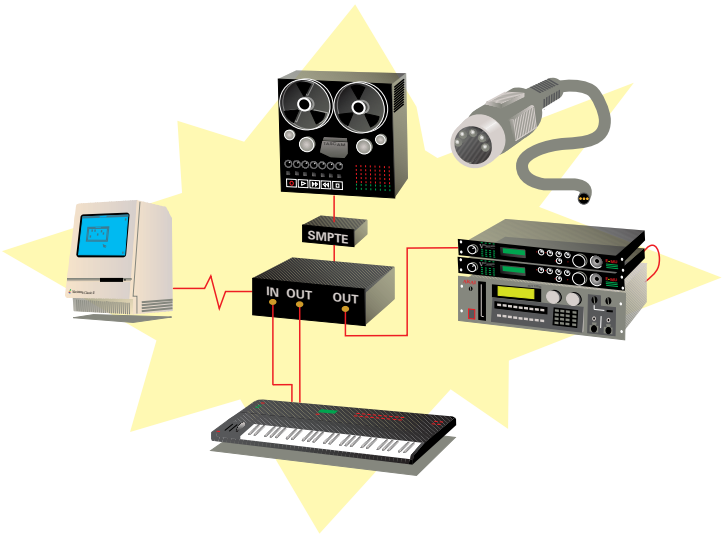
Yamaha Sound Edge SW20-PC
Price £148
Contact Et Cetera 01706 219999

Good Points Superb sound, particularly the WaveTable samples.
Bad Points Limited games compatibility. Dated CD-ROM interfaces.
Conclusion For Windows MIDI musicians only.

Anatomy of a sound card



What is MIDI?



The Musical Instrument Digital Interface, or MIDI, has been around for about 13 years. It was developed as a communications protocol for two or more musical instruments, allowing them to "talk" to each other. Just like computers use modems to communicate and exchange data, MIDI allows musical instruments to exchange information and operate remote instruments: this could be from an external keyboard, or a computer playing a MIDI file.

MIDI was first developed to allow keyboard players to "layer" the sounds produced by several synthesisers. Today, though, MIDI is used mainly for sequencing. A sequencer is a piece of software that records and plays back MIDI information. It allows complex musical arrangements to be built up that would otherwise be impossible for one person to play.

MIDI doesn't transmit any sound, though, just simple binary information. The 1s and 0s that are sent down the cables contain very specific instructions. The most common instructions tell the receiving instrument to play a particular note for a duration of time — a "note on" message followed by a "note off" message. The same instructions contain details of how loud to play that note.

But how does the synthesiser know what sound to play? It doesn't. A simple program change message takes care of that. This message tells the synth to select sound number 67, for example, which in the General MIDI specification is a saxophone. Before General MIDI came into effect, sequences that contained program change messages were meaningless if played back on instruments other than the one on which it was recorded. This was because program 3 on the original synth may have been a piano, while on another it may have been a trombone. The result is a tune that sounds nothing like the composer intended.

MIDI communicates over 16 channels (in much the same way that you can have seven SCSI devices in a chain), allowing up to 16 MIDI instruments to be played from just one interface. Since the majority of sound cards are multi-timbral, 16 instruments can be played simultaneously from just one device. Adding a second MIDI interface opens up another 16 MIDI channels. Some MIDI interfaces offer as many as 16 outputs, making it possible to access 256 at the same time. This might seem ridiculous, but in large MIDI setups, channels become as important as RAM — you can never have enough.

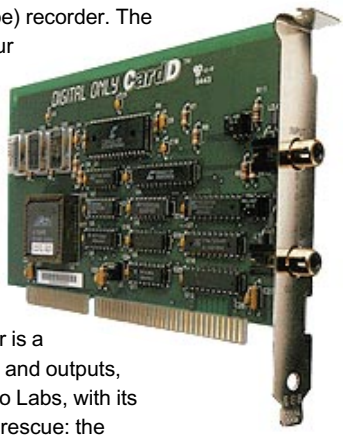
Steven Helstrip

Digital input and output

Our panel, "Sampling and direct to disk recording" (page 155) explains the process of converting analogue sound into digital information for storage and manipulation on your hard disk. That's all very well; but what if your audio is digital to start with? Compact Disc audio, for instance, is stored digitally on the disc and it seems a shame to pass it through a DAC (digital-to-analogue converter) just to resample it again with your sound card.

You can cut out the middle man and avoid a loss in quality. The CDGrab Professional utility can copy the digital information directly off a CD-ROM drive and onto your hard disk in WAV format. The resulting WAV is, of course, in 16-bit stereo 44.1kHz format. Right now, CDGrab requires a SCSI CD-ROM drive and hard disk, but an IDE version is under development.

So, you've got the audio onto your hard disk completely digitally and edited it, but what about getting it back out in digital format? A digital output could be fed through a high-quality hi-fi DAC, or directly into a DAT (Digital Audio Tape) recorder. The two Creative Labs cards in our review offer digital outputs in the SPDIF (Sony/Philips Digital InterFace) format but only for the synthesiser and sample bank — not for WAVs, unfortunately, which limits your digital output to files which can fit in the on-board RAM.



The only complete answer is a sound card with digital inputs and outputs, and this is where Digital Audio Labs, with its CardD system, comes to the rescue: the plain CardD is a decent, normal card with an optional board boasting SPDIF input and output sockets.

Purists could make do with the standalone Digital Only CardD which is a very simple-looking 16-bit ISA card with gold-plated SPDIF Digital In and Digital Out phonos. Windows drivers (95 compatible) capture 32, 44.1kHz and 48kHz signals in WAV format for editing in any package. Just connect the SPDIF digital output, your CD, LaserDisc, DCC, MiniDisc or DAT machine to the CardD's input, record away like any other sound card, and then feed the output straight into a hi-fi DAC or DAT for final mastering.

Once you've switched off your PC and played back the DAT without any whirring hard disks or fans, you'll appreciate the virtually loss-less quality a completely digital system can offer.

Unfortunately, the digital-only market is an extremely small and specialised one, with few competitors and hence relatively high prices. The Digital Only CardD may seem expensive, but it works and could be your only choice.

Gordon Laing

CDGrab Professional for DOS £50; CDGrab Professional for Windows £85; Digital-only CardD £339; all from Etcetera Distribution 01706 219999

Sampling and direct to disk recording

When a sound card records analogue audio, it is converting the sound waveform into digital information and copying it, in real time, on to your hard disk. This copying process is known as direct to disk recording, or d2d. It is, in effect, using your hard disk as a digital audio tapeless-tape recorder.

Recording audio on to your hard disk has several advantages over conventional tape. There's random access, the ability to jump almost instantly to any part of your file without winding through reams of tape. You can cut down on nasty mechanical analogue artefacts, like crosstalk in multitrack recording, and noise after having applied effects.

Then there's splicing, the process of sticking two pieces of tape together, which can often be done much quicker on a hard disk, and for Digital Audio Tape (DAT) can only be done on a hard disk.

After manipulation, the sound card takes the digital information off the hard disk, converts it back into analogue, and feeds it to loudspeakers, headphones or a conventional tape recorder.

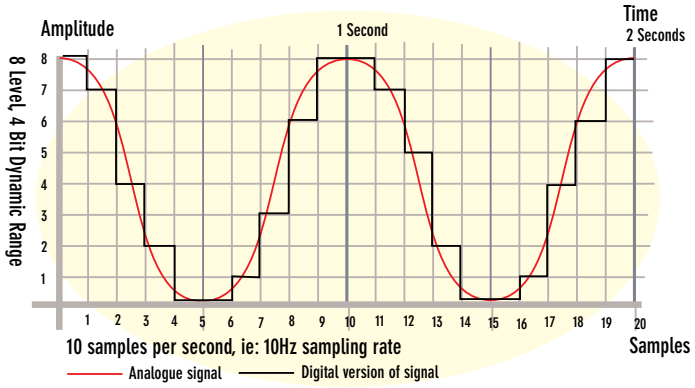
Chop, chop

The process of converting analogue to digital is known as digitising, or sampling. With audio, the analogue waveform is chopped into a number of slices per second. At each slice, the amplitude is measured and rounded to the nearest available value. Clearly, the more "chops per second", known as the sampling rate, and the finer the values assignable to the amplitude, known as the dynamic range, the better the representation of the original.

CD digital audio, as described in the Sony and Philips Red Book standard, specifies a sampling rate of 44.1kHz and a 16-bit dynamic range. That's 44,100 chops every second, each one describing the waveform amplitude at that point in time with a 16-bit number; 16-bit itself offering 65,536 steps from which to choose. Remember, CD is a stereo system, so that's two 16-bit words every 44,100th of a second; one for left and the other for right. That works out at around 160Kb/sec, 10.5Mb per minute, or 630Mb per hour. Successful d2d requires that your hard disk be able to maintain this data transfer rate for reading and writing at a bare minimum.

Goodbye to daleks

Most people's exposure to d2d has been with short samples used to indicate Windows operations. Quotes from Star Trek, Terminator and Monty Python are over-used favourites. These may typically be sampled at 11 or 22kHz in 8-bit, resulting in hissy, dalek-sounding quality. But as hard disk prices tumble and bus transfer rates increase to a decent level, many have realised that they can use their computers to record perhaps 10 or 20 minutes of CD-quality audio for serious editing.



The finer the steps, the better the digital approximation of the original, analogue signal

Decent quality on the sound-card front requires 16-bit resolution and sampling rates of 44.1 or 48kHz. All electronic equipment, particularly PCs, have undesirable background noise levels. Always try to fit your sound card in whichever slot is furthest away from the power supply and any other cards. Superior sound cards boast lower noise levels, and higher quality analogue-to-digital and digital-to-analogue converters (ADC and DACs, respectively).

You'll need as much hard disk space as possible, with ten minutes' CD quality requiring over 100Mb. The faster the disk the better, when you're working with such large files. Fortunately, most audio work is concerned with sustained data transfer. Typical modern PCs with E-IDE drives on a local bus can sustain between one and 2Mb/sec, while dedicated 7,200rpm AV drives on a PCI SCSI bus may sustain up to 7Mb/sec.

Prevent pesky pauses and promote performance

- If you're serious, you'll want to ensure there are no interruptions in the audio stream. Many hard disks pause to thermally recalibrate, which can result in a short but ultimately undesirable pause. Some AV drives are specifically designed not to thermally recalibrate, therefore eliminating this effect.
- Cacheing and virtual memory can work against you, too. Constantly checking the cache to see if there's anything to recycle is pointless for audio recording and decreases performance, so in many cases you should try to disable it, at least for the drive on which you record.
- Under DOS and Windows 3.x you should place your temporary directory on your large, fast drive where you intend to record audio. This will maximise performance and ensure you don't suddenly run out of space.
- Windows 95 is a funny beast, to say the least, with its dynamic cacheing and virtual memory which actually varies in size as required. This may be all very well for normal applications, but suddenly hammering the disk to change the cache size will interrupt audio recording and playback.

The best solution appears to be to specify your own virtual memory settings, and setting the minimum and maximum sizes to the same value, thus preventing any pesky changes. You may also want to experiment with reducing or even switching off the read-ahead cache and disabling the writeback cache. If all else fails, you may be better off running Windows 3.x or setting up a dual-boot system. All these topics will be discussed in a future Hands On Sound column.

- One final and universal tip is to regularly defragment your sound drive.

With all this optimising in mind, it is certainly worth buying a dedicated second drive for audio alone, or partitioning an existing drive, allowing you to easily keep track of housekeeping.

Gordon Laing

Music software

Only a few years ago, all you would have received with your new sound card was a driver disk and a handful of useless applets allowing you, for instance, to turn your PC into a talking clock. Now, it seems that just about every manufacturer is supplying reams of worthwhile applications with their cards.

Sound cards don't just make games and multimedia applications sound great: with the right software you can compose, edit and print your own music, too. You can learn to play the piano, record and edit digital audio and play audio CDs from your desktop.

So what *can* you expect to find bundled with your sound card? The most common applications are sequencers, wave editors and audio players.

Sequencers

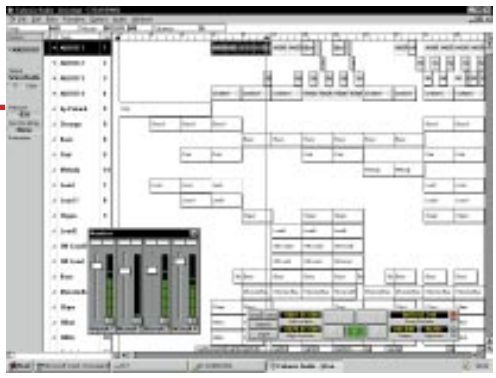
Now that sound cards have made the transition to WaveTable synthesis, temptation runs high to dabble with the on-board sounds. With a sequencer, not only can you play through the sounds, but you can record and edit what you play, too. A basic understanding of MIDI is usually required to get the best from a sequencer.

Midisoft's Recording Session can be found bundled with several cards featured in this group test, including Orchid's NuSound. It provides 16 tracks for recording MIDI information and allows you to edit your performances using traditional notation. It provides full General MIDI support, enabling you to select instruments by name rather than number. There are controls for reverb and chorus settings as well.

Cubasis Audio

If you want to take sequencing further, Cubasis Audio provides 64 tracks for MIDI plus four tracks for recording digital audio. This enables you, say, to record a live vocal over your musical arrangements. Audio tracks can be manipulated in much the same way as MIDI tracks — for example, you can copy phrases, layer tracks and move parts around. Cubasis also offers more ways in which to edit MIDI data: there are score, piano role and list editors.

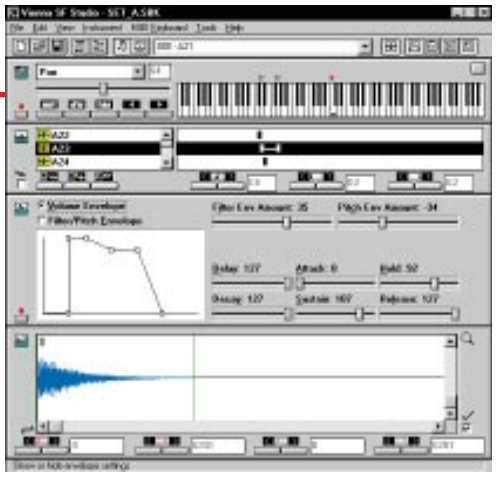
Cubasis Audio
Price £250
Contact Harman Audio 0181 207 5050



Wave editors

WaveStudio is supplied with all Creative Labs' cards. If you want to record audio on your hard disk, or simply want a different sound to play when you exit Windows, you can use a wave editor to manipulate digital audio. The first generation of wave editors could only record to RAM but most will now allow you to record direct to disk, allowing much longer files to be recorded (hard-disk space permitting).

Editors allow you to record in a variety of resolutions from 11kHz 8-bit mono, up to professional standards of 48kHz 16-bit stereo. Once you have a file recorded, you can remove sections, create fades, reverse sections and apply effects such as echo.



Synthesiser editors

The Creative Labs AWE-32 sound card contains 512Kb RAM for downloading your own samples to use as MIDI instruments. Vienna sound editing software is bundled, so you can layer instruments and create keyboard regions, enabling several instruments to span the keyboard. It also lets you edit each of its 25 LFOs, oscillators and filters.

Vienna provides direct access to the samples held in ROM. By editing the many parameters available, you can create new sounds and save them as new sound banks. When used with a MIDI sequencer, the AWE-32 has a wealth of features which are normally only found within professional audio equipment costing thousands of pounds.

Steven Helstrip

WaveTable daughterboards

Considering buying a WaveTable sound card? Before you rush out and part with your cash, you might like to consider upgrading your existing FM card with a WaveTable daughterboard. One simple upgrade can cost as little as £66, not only saving you a bob or two but also the trouble of installing and configuring a new sound card.

WaveTable daughterboards are compatible with any 16-bit sound card with a feature connector. This can be found quite easily at the bottom left-hand side of the card near to the blanking plate, and looks similar to a CD-ROM interface, only smaller. Some cards, including the Value edition of the SoundBlaster 16, may not have this connector, so check first.

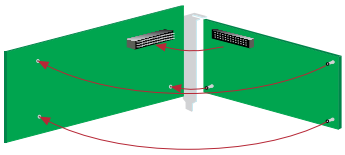
Installing a WaveTable daughterboard couldn't be easier. Remove your sound card and "sit" the daughterboard on top, making sure the connectors are firmly attached. Three plastic spacers will be provided, as well, which prevent the two cards from damaging each other.

The most interesting thing about this type of upgrade is that you don't have to install any software for it to work. There are no dip switches to configure, either. If you want the daughterboard to be the default synthesiser in Windows, as is likely, you will need to edit the MIDI mapper (or MIDI output port if you're using Windows 95). This is straightforward, too, and is explained in the manuals.

Orchid WaveBooster 2

The quality of the instruments each WaveTable daughterboard has to offer differs significantly, and is usually determined by how much ROM the card has. Most cards contain between 1Mb and 4Mb of samples, and offer digital effects including reverb, chorus and delay.

Reverb gives the impression that the instruments are being played in large halls, or churches — great for when you're playing Doom. When chorus is applied, the sound is similar to many instruments playing although only one is actually being used. Delay is just a posh word for echo.



So which card should you buy? In the January issue, we tested five daughterboards including those from Creative Labs, Roland, Orchid and Yamaha. There were two clear winners: the Yamaha DB50 XG and Orchid's WaveBooster 2.

The WaveBooster 2 was the best card at the budget end of the range. It offers full General MIDI compatibility and is supplied with Cubase Lite, a cut-down version of the industry standard MIDI sequencer. At £66, it's a genuine bargain.

Best of all, though, was the DB50 XG. With 676 high-quality instruments, 21 drum kits and masses of digital effects, it's a must-have.

The DB50 XG costs £129 and is supplied with a CD-ROM packed with MIDI and audio files.

If you can find a copy of our January issue, you'll be able to hear a recording of all five cards on the free, cover-mounted CD-ROM.

Steven Helstrip

Orchid Europe 01256 479898;
Yamaha Kemble 01908 369269

Editor's Choice

Personal Computer World EDITOR'S CHOICE

There's no clear, objective, method of assessing sound cards. You can't actually measure a sound card like you can a hard disk or a processor, so a conclusion can only be reached by continuous listening and software testing. If you're a musician, you're likely to be sensitive about the quality of sound supplied as it can vary enormously between cards; but then, different types of users have different needs and not everyone is looking for the best WaveTable synth on the market.

In the popular £120 to £150 mid-range, competition is tough. At these prices, all cards have above average WaveTable samples and are compatible with General MIDI and SoundBlaster standards. Most were plug'n'play, and many featured built-in digital effects.

There was a very close race between the Turtle Beach TBS-2000 and Orchid's NuSound PnP for a Highly Commended award in this price range. Both were plug'n'play and both were compatible with everything you could throw at them. Turtle Beach's on-board WaveTable samples sounded better than Orchid's, but the latter featured a daughterboard interface whereas the former did not.

Additionally, Orchid offered the optional NuPanel front control panel which should really be given away free with the NuSound, but is a nice touch anyway. The NuSound additionally boasted 3D sound, which, while hardly hi-fidelity, did give an edge to games playing.

Couple these features with the fact that it's is a bit cheaper, and the Orchid NuSound PnP comes out on top as the Highly Commended award winner in this price range. It was extremely close, however, and those who do not intend purchasing a WaveTable daughterboard and desire better on-board samples should go for the Turtle Beach TBS-2000 instead.

Our overall winner as the Editor's Choice will come as no surprise: Creative Labs' SoundBlaster AWE-32 remains the most flexible and compatible all-rounder and now boasts plug'n'play facilities. There's on-board 512Kb sampling memory, expandable to 28Mb using the 30-pin SIMM bank. Purists will be tempted by the SPDIF "digital out" jumper (the product review is on page 140, and see our "Digital input and output" panel on page 153). The only disappointment is Creative Labs' on-board WaveTable samples, which sound poor in comparison to many of the others we listened to. There is, however, a daughterboard interface and the possibility of downloading samples to the memory bank, but even taking this into consideration, plus the fact that it is relatively expensive at £200, the AWE-32 remains our Editor's Choice and comes highly recommended.

At the budget end of the spectrum competition was equally fierce, and deciding on a best card in this category was no easy task, either. After careful consideration we chose the Aztech SoundGalaxy Waverider Pro which wins a Highly Commended award in this price range. Reveal's WaveExtreme 32 came close in this category. Both cards are priced at £79 and offer equally good compatibility. The WaveTable samples are not stunning on either card, but in the final analysis, the Aztech's extra 3D game-enhancing sound gives it the edge, and the free headphones are an added bonus.

TABLE OF FEATURES

Manufactuer Model	AudioStar 16-bit AudioStar Wave	Aztech Sound Galaxy W. Pro 32 3D	Creative Labs AWE 32 PNP	Creative Labs SB32 PNP	Miro PCM12	Miro PCM20
Price	£93.61	£79	£199	£120	£145	£225
Telephone	0181 946 9922	01734 814121	01245 265265	01245 265265	01494 510250	01494 510250
Fax	0181 946 9977	01734 819951	01245 706501	01245 706501	01494 510070	01494 510070
Warranty	1 year	1year	1 year	1 year	2 years	2 years
Free technical support	●	●	●	●	●	●
Length of card	Half	Half	Full	Full	Full	Full
Size of samples in ROM	512Kb	1Mb	1Mb	1Mb	2Mb	2Mb
Voice polyphony	32	32	32	32	24	24
Included cables	None	None	Audio, MIDI	Audio	❍	Radio antennae
Maximum sampling rate	44.1kHz	48kHz	44.1kHz	44.1kHz	48kHz	48KHz
3D sound	❍	●	●	●	❍	❍
Built-in effects	❍	●	●	●	❍	❍
Supported Standards						
SoundBlaster	●	●	●	●	●	●
Ad-Lib	●	●	●	●	●	●
General MIDI	●	●	●	●	●	●
GS	●	●	●	●	●	●
MT32	●	●	●	●	●	●
Windows Sound System	●	●	●	●	●	●
FM synthesiser	●	●	●	●	●	●
WaveTable synthesiser	●	●	●	●	●	●
Plug and Play (claimed)	❍	❍	●	●	●	●
Interfaces						
Daughterboard connector	●	❍	●	❍	●	●
IDE	●	●	●	●	●	●
Sony	●	❍	❍	❍	●	❍
Mitsumi	●	❍	❍	❍	●	❍
Panasonic	●	❍	●	●	❍	Audio

TABLE OF FEATURES

Manufactuer Model	Orchid NuSound Pnp 32	Pine PT201-6	Reveal Wave Extreme 32	Roland SCM-15AT	Turtle Beach TBS 2000	Yamaha SW-20
Price	£129	£26.99	£79	£345	£143	£148
Telephone	01256 479898	01908 218812	0181 845 7400	01792 702701	01706 219999	01706 219999
Fax	01256 64222	01908 218243	0181 845 7411	01792 310248	01706 222989	01706 222989
Warranty	2 years	15 months	1 year	1 year	1 year	1 year
Free technical support	●	●	●	●	●	●
Length of card	Half	Half	Half	Short	Half	Three-quarter
Size of samples in ROM	1Mb	n/a	1Mb	4Mb	2Mb	2Mb
Voice polyphony	32	n/a	32	28	32	24
Included cables	None	None	None	Audio, MIDI	None	None
Maximum sampling rate	48kHz	44.1kHz	44.1kHz	n/a	48kHz	48kHZ
3D sound	●	❍	❍	❍	❍	❍
Built-in effects	❍	❍	❍	●	❍	●
Supported Standards						
SoundBlaster	●	●	●	❍	●	●
Ad-Lib	●	●	●	❍	●	●
General MIDI	●	●	●	●	●	●
GS	●	❍	●	●	❍	❍
MT32	●	❍	●	●	❍	●
Windows Sound System	●	●	●	❍	●	●
FM synthesiser	●	●	●	❍	●	●
WaveTable synthesiser	●	❍	●	●	●	●
Plug and Play (claimed)	●	❍	❍	❍	●	❍
Interfaces						
Daughterboard connector	●	●	❍	●	❍	❍
IDE	●	❍	●	❍	●	❍
Sony	❍	Audio	●	❍	❍	●
Mitsumi	❍	Audio	●	❍	❍	●
Panasonic	❍	❍	●	❍	●	❍

KEY ● Yes ❍ No

the all-in office

Wave goodbye to the paraphernalia of the modern office! You can now run it all from a PC and a peripheral card..

A SECOND REVOLUTION IS under way in offices, just a couple of decades after the rout of King Typewriter by the PC. Two years ago you would have needed a phone, a printer, a fax, an answering machine, a PC and perhaps a modem, copier and scanner to start a small business. You would thus be buying up to four paper-handling mechanisms, three scanning mechanisms and three print mechanisms, as well as three telephone interfaces, to say nothing of the duplication of intelligence and power supplies.

A new kind of office is beginning to appear, centred around a PC and a single all-in-one peripheral. Simon Rockman looked at some of these multifunctional products in December's *PCW*. This article looks at an alternative approach which packs most of the functions into the PC, using an add-on card.

The latest devices extend the streamlining process even further by combining the functions of a sound card and a fax-modem; but just as important is the software bundled with them — particularly the extent to which it takes advantage of the growing convergence between computing and telephony. Telephony packages allow you to set up an office using just a printer and a PC, saving you hundreds on the cost of standalones. And they give you many extra facilities to boot.

Your fax printouts will be better and

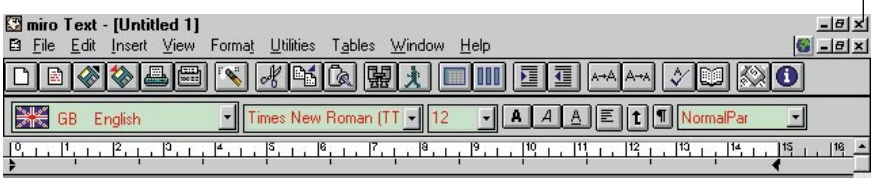
miro magic

The taskbar gives a good idea of the facilities offered by the miro package. Clockwise from top left: the icons summon an organiser, a word processor, a spreadsheet, a comms module, a version of the LapLink connectivity program, a version of the Chameleon Internet suite, CompuServe access, a fax manager, a fax cover sheet editor, a phonebook editor, an answering machine, a rather good Europe-wide route planner, a CD player and sampler, launcher and comms configurations, a phone dialler, and exit. LapLink and Chameleon could cost you the price of the entire package if bought separately.

The word processor and a spreadsheet unashamedly copy the look and feel of Microsoft's Word and Excel, and read and write their formats. miro states that Microsoft approved the modules, but with Microsoft's Office suite now commanding at least 85 percent of the market, they could set an important precedent.

The miro clones are better in one respect than the originals, which make heavy weather of sending a fax. miro lets you do this at the click of an icon. And, as you would expect from a European program, it allows you to change languages easily.

Fig 1 *The miro word processor. Note the fax icon next to the printer button, and the facilities for changing language*



cheaper, because they are done on plain paper on your printer. You will not, on the minimum system, be able to fax paper-based documents; but you can if you buy a scanner, which will capture documents and images at far beyond fax quality.

The full potential of this kind of set-up is only slowly being realised, partly because of the multiplicity of international regulations. For instance, mainstream packages have yet to take advantage of Caller Line Identification (CLI) — though see "How to stay single" on page 177. Specialist telesales applications typically use the CLI-supplied number as a pointer to a caller's file, which can be fetched and screened while the call is being answered.

One snag with all this is that your PC (but not your monitor) needs to be switched on all the time to listen for calls. Although this will not damage the machine, it is a waste of energy unless your PC offers a low-power mode for the purpose.

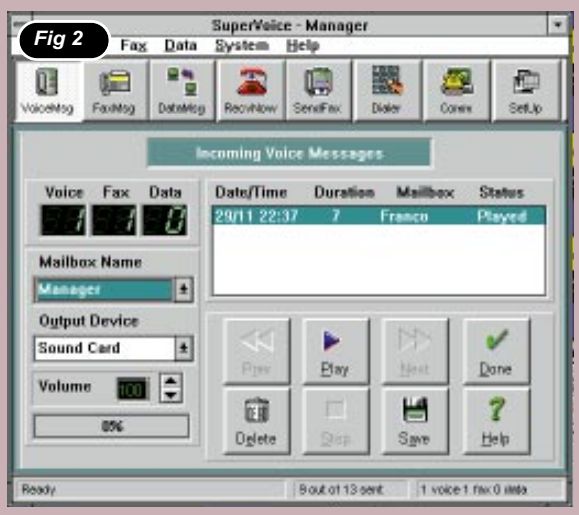
The miroConnect 34 office

This ambitious package is a complete applications suite, targeted at the small office/home user. The 16-bit ISA card that comes with it takes economy to a new level by building the sound and modem systems around a single digital-signal-processing (DSP) chip, IBM's Mwave DSP2780.

Installation is relatively painless, subject to the usual lottery on whether or not the card conflicts with your existing configuration. But the software takes up 70Mb of disk space and you end up with a garish miro advertisement for your desktop wallpaper.

Also installed, and visible whichever application you are in, is an overlarge icon showing three sides of a cube. One side calls up a fax manager, another gives you a phone dialler and the third brings up a taskbar carrying buttons for all the bundled modules.

The scope and value of the software is impressive (see the "miro magic" panel, opposite), though the spreadsheet and word processor are very basic. You get a voice-enabled version of LapLink which lets you control a remote machine at the same time as talking to its owner.



Salesmen are fond of saying that this kind of facility is useful for teleworkers, but its most popular use is for playing games.

You can leave up to three separate voice messages on your machine, for different times of the day: busy for your boss in the morning, cool for your friends in the evening, and a cold welcome for anyone who rings late. However, the telephony facilities fall rather short of what is possible.

PhoneBlaster

Creative Labs' PhoneBlaster package should be available in the UK by the time you read this. The hardware differs from miro's in that it uses two DSP chips: it is basically a Rockwell-chipped 28.8Kb/sec fax-modem, sharing a card with Creative's own SoundBlaster 16 sound unit.

There is an impressive range of bundled software, as with the miro, but focused more on audio (mixer, midi, voice control) and telephony. We had some difficulty setting the package up because the Win 3.1 software we were sent objected to Win95. Also, the modem defaults to Interrupt 11 for the Com 3 port, which Win95 does not allow.

Telephony functions are courtesy of a version of the SuperVoice package, with support for up to 1,000 mailboxes which take voice, fax or data messages, each carefully logged (*Fig 2*). The SuperVoice setup screen gives you some idea of the facilities (*Fig 3*).

You can forward faxes, send messages to pagers, batch fax, play selected music during "on holds", or set up a bulletin board where files can be downloaded or received. This is all orchestrated by voice messages prompting and responding to numbers pressed by the caller.

Creative Labs itself provides a good illustration of how *not* to use all this. Ring its US helpline and you will be taken through umpteen voice-driven menus; what feels like five exasperating minutes later, you get a voice breaking the news that no human is available to talk to you.

But it could be fun to set up. If you are not frightened of using a script language,

you could make an "Arthur Daley" start-up on the Old Kent Road sound for all the world like a multinational ("dial 873 for Oil Exploration, South Atlantic"). Or you could set up an online jukebox (choose your music while you wait).

You can run all this on a single phone line. In fact, the PhoneBlaster comes with a microphone so you do not even need a phone handset. Your PC becomes a phone (*Fig 4*), and you can do all your dialling from the screen. CLI facilities and voice-with-data calls will be enabled in later versions.

Other packages

Similar packages were coming on to the market or were in the pipeline as we went to press. Diamond has been selling one called Telecommander in the US but the European launch has been cancelled. Diamond has been trying to buy up modem pioneer Hayes, and clearly plans more products for this area.

Aztech's Audio Telephony 2000 package will be available this month and comes in 14.4Kb/sec and 28.8Kb/sec versions. (I would not recommend anyone buying a 14.4Kb/sec model for anything but the most rudimentary use.) I didn't get a chance to test it, but the spec looks similar to that of the PhoneBlaster, with a full range of audio and telephony software.

One benefit of all these packages is that you get sound-card facilities thrown in. If your PC already has a sound card, you might look at some of the cheaper fax-modem bundles available from the likes of Dataflex, Electronic Frontier, Pace and US Robotics.

Escom was selling Dataflex's PC Comms Office on a special offer at Christmas for just £99, though the list price is £129. It comes with a fax-modem and CyberWorks telephony software that can match much of what the PhoneBlaster offers, although the audio features are more limited. But it comes with a microphone and will turn your PC into a speakerphone (see *Fig 5*)

A 28.8Kb/sec version will arrive in Escom shops next month; it is listed at £179 but is likely to be discounted.

Conclusion

The miroConnect 34 is very good value and would suit someone buying a complete new system, and who needs a comprehensive suite of software. Don't reckon on putting too many demands on the word processor and spreadsheet, though. It would also suit teleworkers who need access to a remote PC.

The PhoneBlaster gives a better idea of the evolving new office, with all kinds of communication tightly integrated into the phone-enabled PC. Of the two, this would be my choice.

But telephony packages are in their infancy, interesting as much for what they are likely to become as for what they do now. There is more to them than meets the eye; they show that you do not need the Internet to get alien PCs working together, easily, over the telephone.

PC telephony should allow you to email a phone number with all the immediacy of a fax. It lets you swap files while you talk. Given a suitable camera, users can see each other. Once people start to use PCs as phones (or vice versa), Web-style home pages can replace those interminable voice-mail menus.

PC-phones are not about to supersede the Web, but they will evolve with it and complement it. In the meantime, be warned: however friendly your software, it is not going to beat familiar office machines for ease of use by untrained staff. And voicemail can be counter-productive; more than one company has banned it on the grounds that staff use it to avoid answering the phone. Think carefully before getting rid of that nice, helpful telephonist; wait until you can put her (or him) as a choice on your home page.

Clive Akass

How to stay single

Many people face the problem of whether or not to install a second line (£95, plus rental) to cope with fax and data. Telephony packages allow great flexibility in their use of a single line, but you can buy hardware gizmos that do the same thing. They basically work by distinguishing fax, data and voice calls, routeing them accordingly. Simplest and cheapest is Avro Pacific's Fax Friend (£45), which has just two outlets: one for your fax-modem and the other for your normal phone plus extensions.

The £119 Tornado Trioline fax switch, available from Electronic Frontier, has three programmable outlets which can be used variously for a fax, modem, answering machine or standard phone. Each of these outlets can be addressed locally or remotely by pressing a programmable number, so you could set up a calling machine to address a particular extension.

Craftier still is the £130 Lineplex CS200, which uses CLI (see page 175) to route calls to one of two extensions, depending on the calling number. It can be set up from a PC and will display a caller's number on screen (or inject it into an application); the device remains active when the PC is switched off. It can be used to divert all but preferred callers to an answering machine. Another use is for security, restricting access to calls from authorised numbers.

Lineplex 01483 211858; Electronic Frontier 01734 810600; Avro Pacific 01642 595000

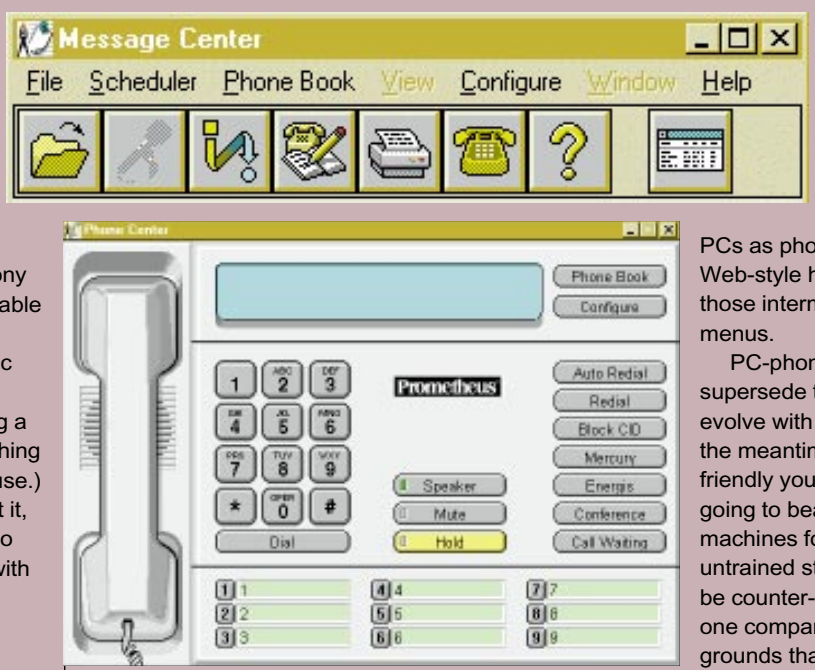


Fig 5 ***Comms Office also turns your PC into a speakerphone (above), with a range of telephony facilities such as a scheduler and directory (top)***

PCW Contacts

Creative Labs 01743 248590; fax 01743 248199
Diamond 01753 501400
miro 01494 510250; fax 01494 510070
Dataflex 0181 543 6417
Electronic Frontier 01734 810600
Pace 01274 532000
US Robotics 01734 228200
Escom 01279 680488

Fast workers

Computer graphics are entering a new dimension with the introduction of 3D accelerator cards for the desktop. The first wave has arrived.

PCW **Spinning 3D Card** Photography by David *Whyte*

Diamond Edge 3D 3240XL

WITH THE CONTINUING push for ever more realistic and flexible computer graphics, particularly in the games domain, the demand for dedicated 3D hardware has increased dramatically.

Processors that were once available only on high-end workstations have found their way onto arcade machines, video game consoles and now desktop PCs. New graphics boards claim to add, literally, a whole new dimension to the way in which you work, rest and play.

Reviewed here is the first wave of PC 3D accelerators from Diamond, Matrox and Creative Labs as they battle it out to see which can become the standard. We tested Apple's latest hardware for PowerMac users, too.

Diamond Edge 3D 3240XL

This could be just the ticket as an all-in-one 3D card for your home PC. It's billed as a "Designed for Windows 95" plug-and-play 3D multimedia accelerator and comes bundled with top games like Nascar Racing and some Sega titles.

The 3D processor used on the Edge is the Nvidia NV1 multimedia accelerator. It incorporates 2D, 3D and video acceleration, 16-bit wavetable audio, a digital games port and two Sega game controllers. The maximum resolution supported is 1,600 x 1,200 pixels at 256 colours. The NV1 chip is unique in its ability to display up to one billion colours in 32-bit pixel mode. No-one currently utilises this facility in their software, but the option is available for programmers if they so choose.

A Sega gamepad interface **(circled)** *lets you play selected titles like Virtua Fighter* **(left)**

The gamepad interface with the Diamond Edge 3240XL enables fast and furious 3D game playing

Also unique is this card's use of Quadratic Texture Mapping (QTM) as well as Bilinear Texture Mapping (BTM). QTM provides far superior quality to BTM, by adding smoothness to polygons that are connected together, particularly when drawing images that appear to be far away. The only problem with QTM is that, due to its complexity, programmers have difficulty including it in their applications. The Edge 3240XL is the only 3D product to make use of it (at least until mid-1996).

The 3240XL provides hardware texture mapping with a delivery of 100 million pixels per second, allowing a potential frame rate of 30fps at 65,000 colours (16-bit) up to a resolution of 1,024 x 768. To achieve this rate, the Edge exploits the PC's system memory as the texture map source and reduces the product's cost in the processor.

In terms of performance the card holds up well, especially when playing the Sega Virtua Fighter Remix. The colours are resilient and the 3D pan-and-zoom action is fluid. We even felt it was somewhat faster than the Saturn version, although the speed will vary depending on the host machine.

Diamond is currently the only company to carry Sega titles, and there's no guarantee this will continue. When playing Nascar Racing, the rendering was reasonable yet slower than versions played on the other cards in this round-up. We did not run it from a DOS-only environment, however, as we did with the other two PC-based cards.

The one real downside of the Edge card was the difficulty we had achieving sound compatibility outside of the included games (see First Impressions, February).

PCW Details

Diamond Edge 3D 3240XL
Price £359 (street £319)
Contact Diamond Multimedia 01753 501400

Good Points Virtua Fighter is impressive. Fluid rendering.
Bad Points Full sound capability limited to included games. Nascar rendering a bit slow.
Conclusion Great when playing the included games but the sound falls down on other games.

Creative Labs 3D Blaster

3D Blaster

The Creative Labs 3D Blaster is the odd one out of the PC-based cards because it is a VL rather than a PCI bus-based card. You would think this odd if you had bought a PCI Pentium-based PC in the last two years, but according to Creative Labs there is a large VL bus market hungry for games add-ons, so the company is aiming squarely for it.

The 3D Blaster makes use of the Gigi chip, a scaled-down version of the Glint 300SX chip made by 3D Labs. Like the Diamond Card it is designed primarily with 3D games acceleration in mind. This is reflected in the games included with the card that have been designed to take advantage of the chip's capabilities.

The Blaster boasts full screen anti-aliasing, where images are rendered at a high resolution and filtered down to a lower one to provide high-quality images. It supports standard 3D APIs, Z-buffering, and hardware-based texture mapping for polygon-based games.

We didn't have an opportunity to install the card ourselves, but Creative Labs assures us it is a plug-and-play "Works with Windows" graphics card.

Of the three PC cards the Blaster was the junior, mainly because it's meant to act solely as a 3D accelerator in conjunction with your existing graphics card. Its standard configuration supports 640 x 480 pixels at 65,538 colours and 1,024 x 768 at 256 colours with memory enhancement. The monitor interface is via a standard 15-pin VGA loop cable from the 3D Blaster to the graphics card.

The requisite drivers for DOS, Windows 3.1x, Windows 95 are included, plus four games titles — Hi-Octane, Rebel Moon, Nascar Racing and Magic Carpet plus.

The Blaster's 3D performance held up well. We compared a standard software version of Hi-Octane with the Blaster accelerated version, and the difference was like night and day. It went from jerky movements and jagged edges to smooth-flowing anti-aliased images on a 486DX-100 at 640 x 480 resolution. In fact, it was almost as fast as a Pentium-based PC.

For those owners of PCI-based PCs, Creative Labs says a PCI edition of the Blaster will be available by the summer.

PCW Details

3D Blaster
Price (excl VAT) £299, (street £249)
Contact Creative Labs Pre-Sales 01245 265265

Good Points Noticeable speed boost to included games. Good for older VL-based 486DX2 or higher systems.
Bad Points Only available in VL-bus format.
Conclusion A good card for those with older systems who aren't planning to upgrade but still want to have fun.

Matrox MGA Millennium

The Matrox MGA Millennium wasn't specifically designed for games use; it was designed for CAD use, at an affordable cost. But that hasn't stopped people using it for games, and this is evident in Matrox's marketing strategy:

the card comes bundled with Nascar Racing.

The Millennium uses the MGA 2064W chip and WRAM (Windows RAM). The MGA chip is, most definitely, a 3D graphics accelerator, and its strength lies in Gouraud shading and Z-buffering. The card is capable of rendering 190,000 50-pixel Gouraud shaded, Z-buffered, 65,536 colour, dithered polygons per second.

The presence of WRAM (currently produced by Samsung, exclusively for Matrox) also sets this card apart from the others as it is a dual-ported memory. This feature provides for a consistent high bandwidth across all resolutions and colour depths, so functions like the Z-buffering and double-buffering take place in this fast memory, allowing for accelerated 3D graphics.

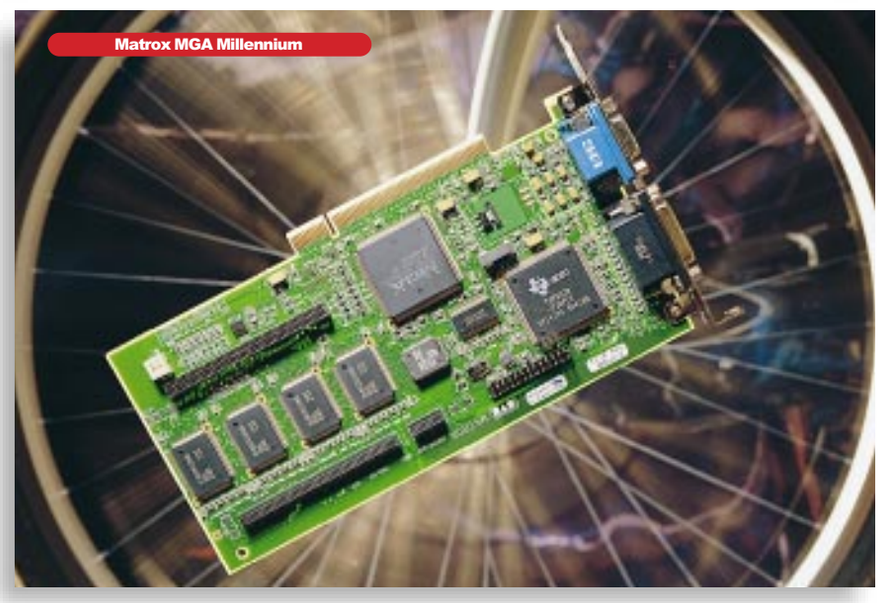
What the Millennium lacks is the presence of anti-aliasing (removing jaggies) and texture mapping in the hardware. The primary reason for this, according to Matrox, is that the market segment and applications for which the card was designed, like AutoCAD, don't require it; hence it doesn't have the same texturing capabilities as the other cards. It does, however, manage reasonable texture mapping for DOS-based games and increases Windows 95 graphics by 40 percent.

Application Z-buffering and Gouraud shading shows through in Millennium's 3D rendering. Note the depth of the chess board

The MGA Millennium PCI card we looked at came with 4Mb of WRAM, which enabled it to display dithered 256 colour 3D at 1,152 x 882; 65,536 colour 3D to 800 x 600; and 16.7 million colours at resolutions up to 640 x 480. The bundled software consists of the MGA Millennium Powerdesk, Asymetrix 3D FX, the aforementioned Nascar Racing, and the software MPEG viewer, Compcore Softpeg.

As a card tha hasn't been designed primarily for games, the Millennium held up well compared with the others here. In particular, its handling of the Nascar Racing game was excellent: it ran a tad faster than with the Edge 3D, as was also the case when we ran Doom2.

However, the real strength of the Millennium showed while running Asymetrix 3DFX. Here the Gouraud shading was evident, particularly with



Havoc, from Reality Bytes, with and without Apple's 3D board. Note the smooth shading and clearer display in the left-hand screenshot

Common 3D terms explained

Anti-aliasing: (Also known as *mip-mapping)*. The process of reducing the amount of rough or jagged steps seen at the edges of objects on screen. It works by inserting extra lines around an object, half-way between the two colours at its border. More lines, half-way between the extra line and its borders, can further soften the effect. The Windows 95 Plus Pack includes anti-aliasing for fonts. On close-up, anti-aliasing can looked blurred, but for most purposes it works well.

Shading: When a shape is illuminated, it reflects light. Working out just how much is reflected can be processor-intensive but adds realism. Two types of shading trade off these requirements: *Gouraud Shading* calculates how much light falls on, and is reflected on, a whole surface and then colours that area evenly; *Phong Shading* breaks this down pixel by pixel. Since light falls off by the square of the distance from the source, this can give radically different effects on a large, or curved, area.

Texture mapping: Not all shapes are a solid colour; some are painted with patterns. If you merely wrap a pattern or picture around a shape, the image can become distorted. Texture mapping removes the distortion by mapping the pattern to the exact shape of the object.

Quadratic Texture Mapping (QTM): QTM breaks down 3D objects into four parts, defined by nine control points which, in turn reduces processor overhead and makes 3D rendering up to 50 percent faster than traditional methods.

Z-sorting: When a 3D image is viewed on a flat screen, only one view is possible at a time, and some objects, or parts of objects, will be hidden by others in front. These hidden bits are traditionally still drawn by the computer, wasting valuable processor time.

With Z-sorting, speed is improved by calculating which faces will be obliterated from a certain viewpoint, and not bothering to draw them.

spherical images. The Matrox MGA Millennium is one of the best and most affordable 3D graphics accelerator cards around, especially for Win95 and CAD.

PCW Details

Matrox MGA Millennium
Price £359; £215 street (4Mb WRAM)
Contact Matrox 01793 441100

Good Points One of the cheapest cards available. Provides excellent application-based (CAD) 3D graphics.
Bad Points Not designed to accelerate 3D games.
Conclusion An excellent buy for business users. Not really meant for the avid games player.

Apple QuickDraw 3D Accelerator Card

Apple has seen the future, it's 3D, and last year released its QuickDraw 3D for PowerMacs. This is a software extension to the Mac OS, providing a standard set of 3D tools and functions that can be used across all applications. The QuickDraw 3D Accelerator Card is designed to improve the performance of anything that uses this architecture.

Measuring 6.88in, the card is remarkably compact compared with its PC cousins. It houses two custom ASICs, 128Kb of SRAM cache and another 512Kb of SRAM for storing texture data. The board is PCI-only so it will only work in the latest PowerMac models, and as with the Creative Labs 3D Blaster for the PC, works in conjunction with the existing graphics hardware rather than replacing it.

Apple's ASICs can render up to 120,000 triangles/sec, and an impressive-sounding ten million trilinearly-filtered textured pixels/sec in both 16- and 24-bit colour modes. It supports Gouraud shading, texture mapping, transparency and Z-sorting, and Apple claims that performance can be doubled by putting two cards into your machine.

Like the Matrox, it has not been designed for any specific area — it simply improves 3D wherever it is being used. Hardware and software installation takes seconds. Apple provides numerous demos to show what the card can do, including the Gerbils rollercoaster, the game Havoc, TextureEyes, a limited version of Cumulus 2.5 image database software, some naff QuickTime movies that don't show anything of the card's power, and an After Dark screensaver.

Apple claims that the accelerator speeds up QuickDraw 3D by a factor of 12, and in tests we could see a big difference between accelerated and non-accelerated functions.

A disturbing feature on all the 3D demos was a large amount of texture tearing. Even on a top-of-the-range 9500/132 this was noticeable. Whether it's down to poor software or badly-designed hardware is unclear.

The QuickDraw's success depends on developers adopting the QuickDraw 3D architecture. The idea of a standard set of 3D APIs on the Mac is superb and Apple will soon be moving the code to Windows, but if applications don't support it, there's no point in having it accelerated.

PCW Details

Apple QuickDraw 3D Accelerator
Price £299
Contact Apple 0181 569 1199

Good Points Plug-and-play. Instant QuickDraw 3D acceleration.
Bad Points Few applications available. Texture tearing.
Conclusion Great, if QuickDraw 3D takes off.

Conclusion

3D graphics are the way of the future, especially for games, but the question of what standard will be used is still very much in the air. As a result, the battle to become the market leader and, by default, the PC standard, is a fierce one.

It was not possible to come up with a specific Editor's Choice for this round-up because the technology is so new, but we have nevertheless come to some conclusions. At present, the Diamond Edge 3D has the most impressive all-round specification and Sega's Virtua Fighter Remix was, without a doubt, the best 3D game of the group.

The Matrox, on the other hand, came through as the leader for a serious application-based environment.

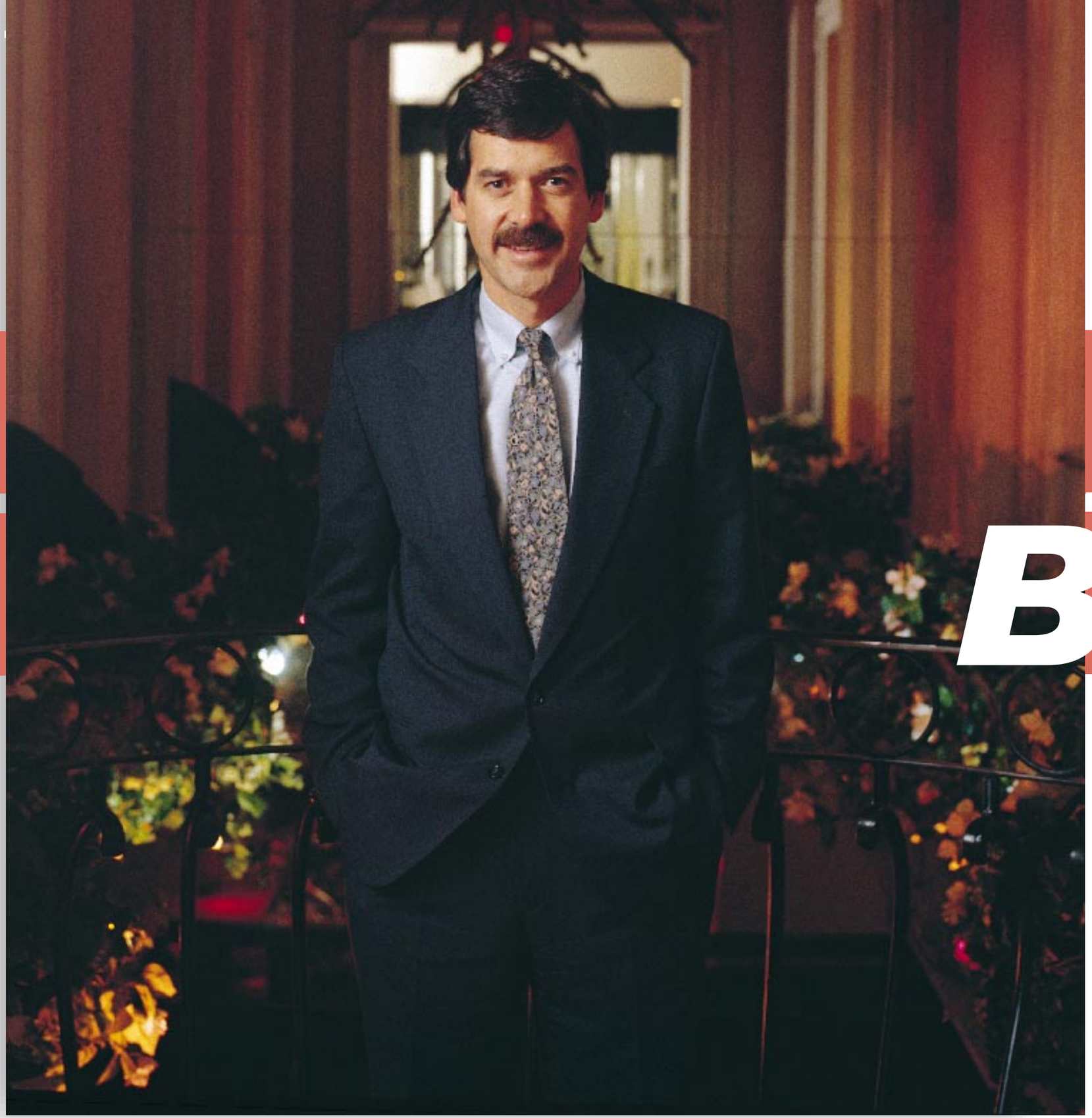
One thing's for sure: the future is 3D and these boards are just the beginning. Up and coming products like VideoLogic's Power VR promise even better performance.

Dylan Armbrust and Chris Cain

TABLE OF FEATURES

	Creative Labs	Diamond	Matrox	Apple
	3D Blaster	Edge 3D 3240XL	MGA Millenium	QuickDraw 3D Accelerator
Manufacturer	Creative Labs	Diamond	Matrox	Apple
Telephone	01245 265265	01753 501400	01793 441100	0181 569 1199
Price	£299	£359	£359	£299
Processor	3D Labs Gigi	Nvidia NV1	MGA	Apple
Platform	PC	PC	PC	Mac
Bus	VL	PCI	PCI	PCI
2D acceleration	●	●	●	❍
3D acceleration	●	●	●	●
Texture mapping	●	●	❍	●
Gouraud shading	●	●	●	●
Z-Buffering	●	●	●	●

KEY ● Yes ❍ No



and so, to Bud...

The man who's aiming to cool Hot Java's boots — Bud Colligan, CEO of Macromedia.

BOOM BOOM IS a new bar, a stone's throw from London's Portobello Road. It is flashily designed, with big reproductions of Roy Lichtenstein and Gilbert and George paintings on the wall, and is staffed by people who could easily be actors and models "resting" between assignments.

It was here that Macromedia chose to stage its official launch of ShockWave, the company's rival to Hot Java. The elaborate multimedia presentation was given by Bud Colligan, Macromedia's decidedly unflashy Chief Executive Officer. Forty-one-year-old Colligan is just above average height, slim, dark-haired and with a large moustache. Clad in a

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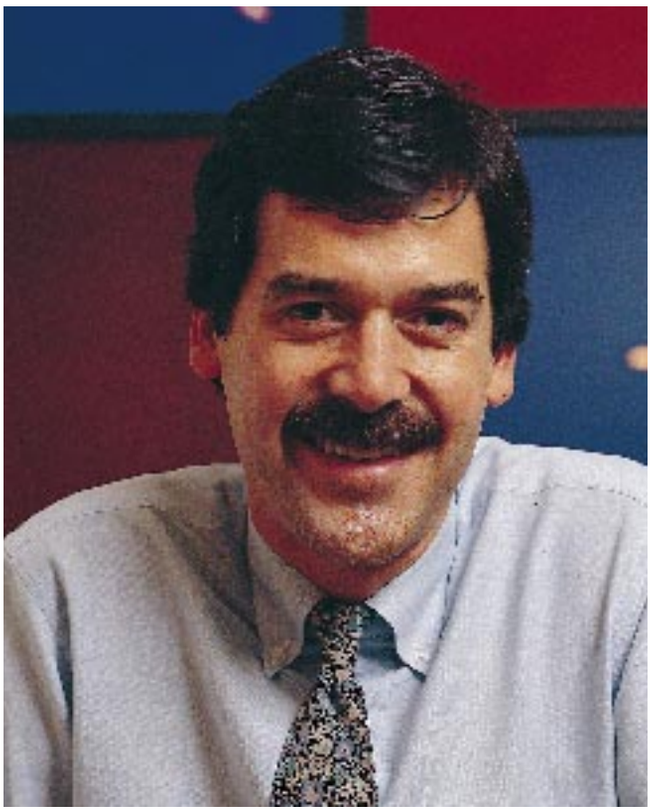


regulation dark blue, single-breasted business suit, he would make a convincing middle manager at IBM, or a store manager at C&A. In fact, Colligan presides ably over one of the most dynamic software companies in the business; one that's seen its stock-market value soar from just $150 million in 1994, to over $2 billion today.

Macromedia is on a roll. The company was the result of a merger, in March '92, between Authorware and Macromind Paracomp. At the time, both companies had revenues of around $12 million or $13 million dollars each. Macromedia's flagship product, Director, is the market-leading multimedia development tool, with over 250,000 users worldwide. Practically any commercial CD you load up, including *PCW*'s cover CD, will have been produced using it. Authorware is equally successful in the interactive/training side of multimedia. Colligan is responsible for a big chunk of this success.

The Apple experience

Colligan began his career in IT at Apple. When he joined the company in the autumn of '83, it was at a crossroads. Its big hit, the Apple II, had crested; the "Lisa" had been introduced, but cost $10,000. Outwardly Apple was successful, but inside, reveals Colligan, there was a lot of worry about the future. Ultimately, it was the Macintosh which saved the company. Colligan joined the marketing department of the Mac division when it employed around 50 people and is still eulogistic about the experience: "It was incredibly exciting. I never thought I'd have another experience like that in my life."

But, says Colligan, his time at Macromedia has been even better, not least because he has been in charge of things. When he was brought in to head Authorware in 1988, the company was based in Minneapolis and had just half a dozen employees. Growth and a move back to California followed, but by all accounts the Macromind/Paracomp merger in 1992 was a painful process; both companies were complete organisations whose duplicated sets of department vice-presidents had to be laid off. The two key products, Authorware and Director, also had some overlap, but completely different distribution models.

Since then, Macromedia has swallowed up another three, smaller, companies and the process has run "like clockwork". The acquisitions placed Macromedia in a pretty strong position. Microsoft's suite approach with Office has helped it to leadership in the business application market and Macromedia is now starting to apply the same approach to its range of multimedia products.

Suite in the Extreme

The Director Multimedia Studio bundle contains Director, Macromodel, SoundEdit and Painter but probably by the time you read this it will have released a new version containing Extreme 3D (its 3D modelling, rendering and animation system), SoundEdit 16 and Xres (its answer to Photoshop). It's using the same approach with its FreeHand Graphics Studio (FreeHand, Extreme 3D, Fontographer and Xres) and the Authorware Interactive Studio, which is tailored more towards corporate learning applications.

The glue for these suites is Macromedia's Open Architecture. "What we've done," says Colligan, "is design our own common logic model. If you think of a layer OLE or OpenDOC, it's a lightweight version of those, that is designed specifically for digital media products and enables Macromedia and third parties to develop plug-ins (we call them Xtras) for Macromedia's products."

Colligan used the example of transitions available in Director. "Now,

What is Shockwave?

ShockWave is a plug-in for NetScape 2.0 which brings sound and animation to the Internet. It can be downloaded free of charge from Macromedia's Web site. Once installed, you can visit any of the sites that have already been "Shocked", for a demonstration.

Anyone with a copy of Macromedia Director can also download a free copy of Afterburner. This takes Director movies and compresses them into Shockwave files. Macromedia claims that in some cases the animations are smaller than the .gif files they replace. Windows 3.* and Windows 95 versions of Afterburner are already available, with a Mac version in the pipeline.

The advantage of Shockwave over Java (see the review in *PCW* Feb '96, p232) is that it requires little or no programming. Java is really a subset of the programming language C++, which restricts its use to serious techies. Shockwave animations, on the other hand, can be produced by anyone who uses Director. Although Director has its own scripting language, Lingo, many people don't use it and Director is generally considered to be easier for creative people to use than Java. Within days of the launch, a number of sites already had some fairly impressive Shockwave demos up and running.

- Macromedia Site: **www.macromedia.com**
- Links to "Shocked" sites: **www.macromedia.com/Tools/Shockwave/Gallery/Vanguard/index.html**
- Where to view Java: **www.java.sun.com**

when someone does a new Xtra that has a hundred different transitions, it will work in Authorware as well… A pixel filter Xtra might work in FreeHand, Authorware and Director." Buttressing the architecture is Macromedia Information Exchange, designed to make moving data between the different applications easier.

Naturally Director faces challenges. "Every year for the last five years we have faced the Director Killer," says Colligan. But he's confident that the breadth of Macromedia's current product range will see them off. "It's not just about creating a tool on a platform, which a few guys can do in a garage. It's about putting together all the technologies and products and extensibility and third-party infrastructure. Almost alone among its rivals, Macromedia can offer suites of products on both platforms (Mac and PC) and is well on the way to offering an open architecture.

"That's not to say we disregard the competition in any way," he says. "Our assumption is that everything people put in their press releases *is* true, even though most of it isn't. And it's our responsibility to beat them, not only so that we remain successful, but to serve our customers."

Young, hungry and excited

Quark and Adobe are two companies most often mentioned as competition for Macromedia. But as Colligan explains: "We're a younger company. We're hungry, and excited to be in the mainstream of dynamic media. I think one thing that's different is that both Quark and Adobe come primarily from static media — from print. We have our roots in dynamic media and the future in terms of online publishing is much more in that area."

Quark remains largely a one-product company. It announced plans a while ago to launch a rival to Photoshop, and Quark Immedia, a rival to Director, but neither product has materialised. Neither Quark nor Adobe has managed to keep up with Macromedia's frenetic product-release pace. "It's all about time-to-market," says Colligan. "This is a new-products industry, and to the extent that we can rev our products more quickly, we're going to win. We've released FreeHand 5 and 5.5 in '94, and Illustrator (Adobe's rival drawing product) has not shipped anything in over 18 months."

Part of Macromedia's secret is to use small groups of programmers. "I don't believe, unless you're doing an operating system or something, that big groups necessarily get things done faster. The real optimum programming group size is about five — your communication lines are most open, and you can share things in the architecture easily. Ten to 12 programmers is about as high as we want to go with development teams." In some cases, Macromedia uses dual development teams so it has ten people working on Director 5, but also has five people working on Director 6.

But the company has made mistakes. Its biggest mistakes, thinks Colligan, were not getting Director onto Windows sooner, and not moving to an open architecture earlier. He estimates the product would now have twice the number of users if those decisions had been made sooner.

His priority for the future is to make "all our products best of breed on the Internet… and to manage our growth." Macromedia, claims Colligan, is bringing multimedia to the Web "before everyone". And he gives a lot of the credit for that to John Doerr, a member of the Macromedia board who also happens to sit on the boards of Internet pioneers Sun Microsystems and NetScape. "He's helped me a lot in figuring out what our Internet strategy should be and making sure we did it early enough."

Time well spent

Like many of the CEOs of high-tech companies, Colligan is extremely clued up about the technology he's involved with. He puts much of it down to his time working with the Macintosh group at Apple. "When you're in that kind of environment, what you have to learn, to be respected and be effective in your job, is quite different from when you're joining a big company in some marketing position," he says. Even now, Colligan chooses to spend a lot of his time around engineers. "Half our executive staff are engineers," he says.

Colligan also likes his contact with creative people in the industry: "I find it very stimulating to be around fontographers and animators and people with lots of earrings. It's different, it's fun."

Ben Tisdall

Colligan comments

… on AOL

● "AOL has licensed ShockWave. It's embracing the Internet as much as it can."

● "AOL is a very good marketing company. You look at different Web access providers, people like Netcom in the US, and most of them aren't very good marketing companies. They put up a few servers, lease some phone lines and they're in the Web-access business. America Online, by contrast, is led by Steve Case who is savvy about marketing consumer products. AOL is increasing in the US alone by hundreds of thousands of users a month."

… on Apple

● "Apple is a $10 billion company and I think they've got a bright future if they continue to focus on their core markets — desktop publishing, colour publishing, multimedia and education."

Will they do well with consumer Macs?

● "Apple is already strong in consumer, in the US. They're not as strong internationally mostly because they never established the education franchise. If you don't have the business/home connection, then you'd better have the education/home connection."

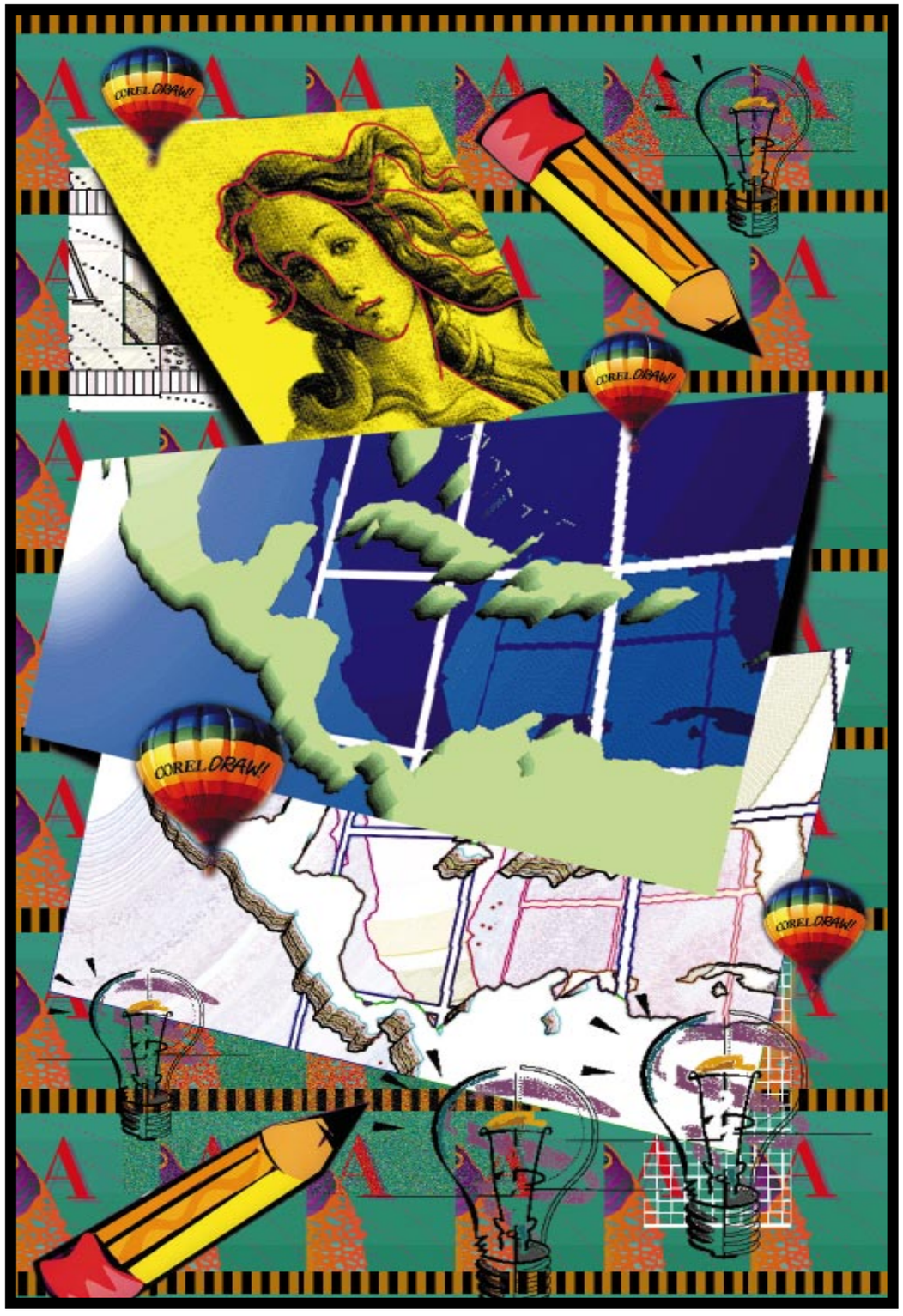
… on Director

What do you say to the criticism that all Director stuff looks the same?

● "I think that's primarily rubbish. When you're creating a tool which has an installed base of 250,000 users, most of those people will use the standard features. Just like most people who do word processing use Geneva, Palatino and Times Roman fonts. Right? And most of them don't use very many design elements when they make their documents, which is why most word processing documents look the same.

"Is that a function of the word processor? No. It's a function of people using the existing functionality of the product and their design expertise. Just like in the general population, there's a scalability of creativity.

"It's the top ten percent who produce the most interesting things. And I would say in this area it's the top one percent. Before Rick Smollin's 'Passage to Vietnam' came out, no-one had seen video and interactivity done the way he did it. Another example is Broderbund's Living Books. I don't think most other books on CD-ROM are done half as well as those."



The Luck of the Draw

Do you want a highly sophisticated graphics suite, or just a basic drawing package? It's a safe bet that there's a permutation here to suit you.

NOW IS A VERY GOOD TIME TO consider buying a vector graphics package. Most of the packages that have been on the market for some time have been rolled out in Windows 95 configurations, and even if you're running a 16-bit version of one of these, it's well worth upgrading. The 32-bit versions not only perform up to 200 percent faster in some situations, they offer other advantages too, such as long file names, dockable toolbars and enhanced drag and drop facilities.

Most packages that have been upgraded for Windows 95 have also had their featureset expanded to include additional drawing tools, better colour support, improved help and tutorials. They also have bigger clipart, font and photo libraries.

The market for graphics packages has polarised into two extremes. At one end there are the expensive high-end professional packages such as CorelDraw 6, Adobe Illustrator and Macromedia FreeHand. At the other end are budget packages, costing less than £40, to serve the home and small office market. But the gap between these two types of packages is smaller than the prices suggest. Low-cost software is, for the most part, very sophisticated and offers a lot of the functionality of the professional packages. As a rule, it demands far less of your hardware, needing less memory and hard disk space and performing faster. What it does tend to lack is the accuracy and flexibility that professional designers require to support the process and spot colour separation methods used in commercial printing.

As always, before committing yourself to one particular package, you should consider what are your design requirements. Do you need to produce sophisticated technical drawings with a high level of precision? Cartoon strips for a magazine? Or just a few flowcharts and organisation schematics for a company newsletter?

It's always worth taking a look at what comes with the package. Budget packages are renowned for cramming in all sorts of extras from fonts and clipart to entire suites of applications software. Corel is a past-master of the software bundle and others have followed suit to the extent that it's now unusual to be offered a standalone vector drawing package.

Some extras are more useful than others. If, for instance, you scan in a lot of line art in the form of company logos, a utility such as Adobe Streamline, which converts bitmap graphics into vector format, may turn out to be a lot more useful than 500 fonts.

Ken McMahon

DRAWING SOFTWARE CONTENTS

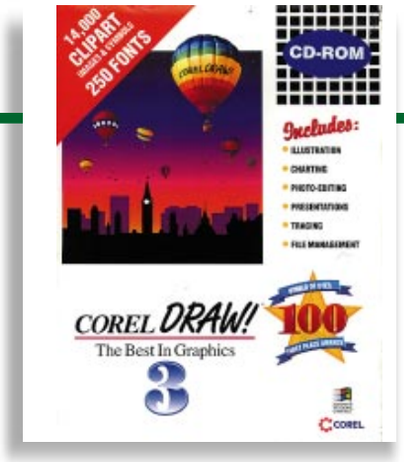
What is a drawing package?

Drawing software uses vectors to describe shapes using mathematical equations. This is the big difference between the packages reviewed here and bitmap editors like Paintshop Pro and Photoshop.

Take a 10cm diameter black disk and place it on a blue background: a bitmap will describe this as a number of black pixels surrounded by blue ones to the image border. A vector format just describes a square with four equal 10cm sides coloured black on a blue background.

The file size of a bitmap is determined purely by its dimensions and colour depth so the complexity of the image has no effect. With a vector file format simple images are much smaller. There's also the advantage that vectors are device independent and scalable without loss of resolution. This means they get the best possible output from any printer or image setter and you can blow up vector images without running into the jagged edges, or jaggies, which plague bitmaps.

Corel Draw 3



Old versions of Corel Draw don't die: Corel continues to sell them at budget prices. You can obtain every version of Draw back to number 3. The CD version of Corel Draw 3 sells for an incredible £42, placing it right in line with other budget packages such as GSP Designworks 3 and Micrografx Windows Draw. Corel Draw 4 and 5 are also available. The former is a good bet, because you get several extra features for a reasonable price premium. Draw 5, however, has yet to be discounted, Corel's justification for this being that as Draw 6 is a Windows 95 product (it won't run under 3.1) version 5 is the current Windows 3.1 product.

Considering its age, Draw 3 is remarkably powerful and sophisticated. A glance at the features list could easily convince you that this is a recent release: multiple layers, bezier curve drawing, text on a path and other text effects, process and spot colour separation, a very flexible blend tool, and 3D extrusion. Draw 3 also sports aspects of the user interface which have become Corel standards, such as toolbar fly-outs and roll-up palettes.

The interface is minimalist by current standards: a nine-button toolbar fixed on the left, nine-option menu bar at the top and a colour palette strip at the bottom.

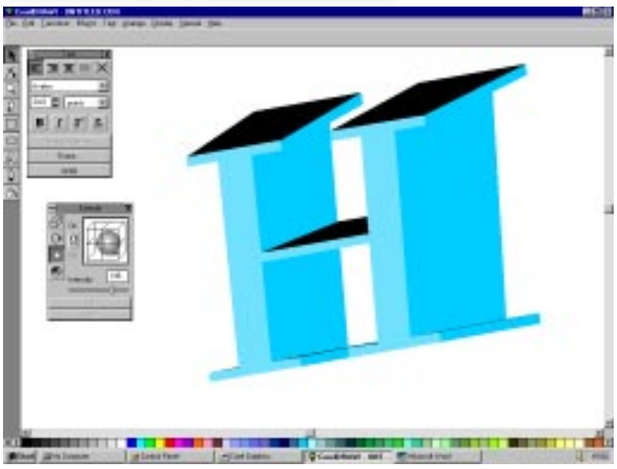
Windows 95 or not, Draw 3 offers a degree of interface customisation in the form of roll-up palettes which can be positioned anywhere and rolled up to show only the title bar when not in use. There are roll-ups available for text and layer control as well as the blend and extrude features.

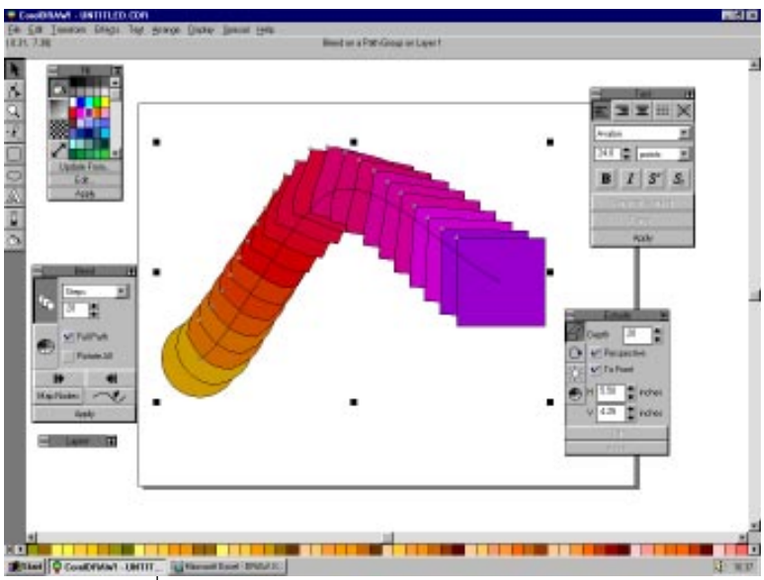
The extrude roll-up allows you to quickly form and edit 3D objects from a 2D original. Opening the extrude roll-up applies a wireframe to your object and you can then fine tune by shifting the vanishing point, changing the perspective and orientation and even create shading effects. The blend roll-up is similarly well equipped, allowing control over number of steps, rotation and skew, distance and node matching — mapping points on the start object to points on the finish object. You can even specify a path along which the blend progresses, which is ideal for creating natural-looking shading and highlight effects on irregular objects.

What you don't get with Draw 3 is any of the 32-bit goodies on offer from its Windows 95 counterparts. But if you can live without floating toolbars, long filenames, drag and drop and that extra turn of speed, it has plenty to offer. It's no slouch and zips along pretty rapidly on a 486/66 on all but very complicated illustrations.

Included in the package are Photopaint 3, Chart 3, Show 3, bitmap-to-vector utility, Corel Trace and the Mosaic clipart viewer. You also get an enormous pile of good quality colour and black and white clipart and 250 Truetype and Type 1 fonts.

If you can't live without enhancements like powerlines (a sort of calligraphy pen), multiple pages, fractal textures, a node edit roll-up, style sheets, drag and drop and better text handling, you need to consider Draw 4 — although being priced at £149, it's nowhere near such a bargain.





Top *A high degree of control is possible over effects like 3D extrusion and blends, you can even specify a path for the blend objects to follow. The interface is made more accessible by the use of roll-ups*

Above *The extrude roll-up is a quick and dirty way of giving the illusion of depth to graphic objects. A wireframe shows the likely outcome before you apply the effect and if it looks awful you can get rid of it with undo, or by selecting clear extrusion*

PCW Details

CorelDraw 3

Contact Channel Market Makers 01703 814142

Price CD £79 RRP (street price £42)

Good Points Powerful transform and effects options. A good bundle with lots of quality apps. Upgrade available to Version 4.

Bad Points Not Windows 95 compatible.

Conclusion A great buy if you don't care much about Windows 95.

Corel Draw 6

The Corel Corporation is no stranger to the concept of the software bundle. While other software publishers were shipping their products in envelopes, Corel boxes were expanding in all dimensions. The move to CD has done little to diminish the physical size of the packaging which, in addition to the four CD-ROMs, contains a one-inch-thick user guide and a two-inch-thick clipart reference book.

All the applications are on CD number one, the version 6 mix comprising Draw, Photopaint, Dream3D, Motion3D and Presents. Of that bunch the new additions are the 3D packages. Presents replaces CorelShow and Ventura. Corel's DTP layout software has been dropped from the suite altogether.

All the programs are 32-bit applications written for Windows 95. The recommended system requirements are a 486DX2/66 with 16Mb RAM. The full install gobbles up 170Mb of hard disk, though there are smaller, custom options. The other CDs hold clipart, photos, video clips, animations, sounds and fonts.

The Draw interface will be familiar to Draw 5 users because there's not a lot to distinguish it, visually. The toolbars are now floating and dockable and there is additional help in the form of Tutor notes, accessed from an Apple button on the top menu bar. Roll-ups — not soggy home made fags, but Corel's shrinkable palettes — are still there, and you can now customise them by forming roll-up groups. This is done by control-dragging one palette onto another. The Mosaic roll-up has been replaced with Multimedia Manager, a more comprehensive utility which lets you browse files on CD-ROM or elsewhere and it has reasonably sophisticated search facilities.

New to the toolbar, as well, are the polygon, knife, panning, eraser, connector and angular dimension lines. The polygon tool, like all the other multifunction tools, has a "flyout" panel displaying several button options. This can be dragged off the toolbar and floated in a convenient spot on the page. In addition to polygons there are two alternative buttons: one for drawing spirals, the other a graph paper tool.

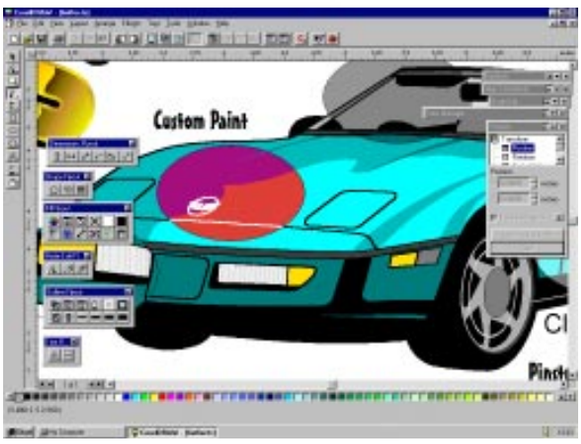
Draw makes extensive use of Windows 95 right mouse button menus. Here they are used to set tool properties (number of twists of the spiral, fill patterns, line style and so on) and to pull up a "what's this?" hint panel describing the tools' functions. The right button can also be used as an editing shortcut for selected objects on the page.

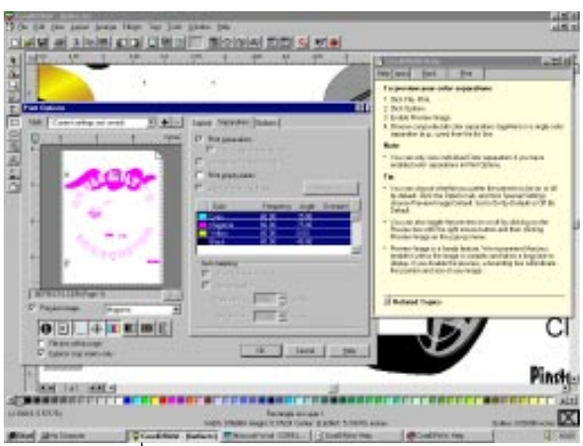
Support for colour has been further improved, allowing control over all pre-press parameters including screen angles and frequencies, overprinting, automatic trapping, spot to CMYK conversion, and more. You can preview separations on-screen before committing to film and thus spot any obvious mistakes. A button bar provides additional, handy, options like registration targets, crop marks, negative image, emulsion down and file information.

All your settings can be saved as a print style and applied to any document when printing. Corel also includes colour management software that enables you to calibrate your scanner, monitor, proofer, and any other devices to ensure predictable colour results.

Corel has concentrated on producing a package optimised for Windows 95 rather than adding a lot of new features. There's not much you can do in Draw 6 that you couldn't do in Draw 5, but you can do it a lot more easily and quickly. There's a raft of utility applications, too, including a bitmap to vector trace utility with OCR capability, a font manager, Corel Depth (a 3D effects utility) and an OLE 2 enabled script editor.

As it stands, Draw 6 is one of the best, most comprehensively equipped drawing packages available for the PC. It is in the same price league as Illustrator and FreeHand. But it remains to be seen whether Corel can keep the two Mac interlopers at bay in the professional market.





Top *CorelDraw's familiar roll-ups are still in use, and can now be customised by grouping functions. The toolbars, including the flyouts, can be docked or free-floated*

Above *Corel's colour separation output options are comprehensive. The preview window is a nice touch, like the button options for targets, colour bars and so on*

PCW Details

CorelDraw 6

Contact Channel Market Makers
01703 814142

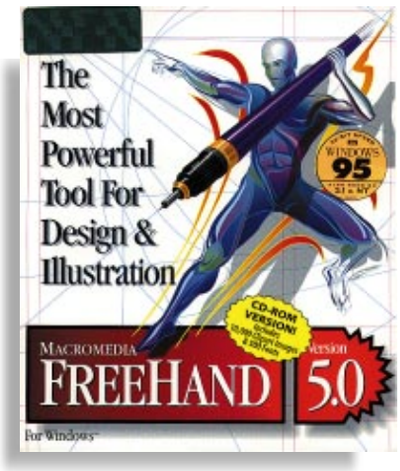
Price £395 (street)

Good Points Well adapted to take advantage of Win 95. Lots of extras.

Bad Points Needs lots of disk space.

Conclusion Probably too expensive for non-professional Win95 users.

Freehand 5.0



Personal Computer World EDITOR'S CHOICE

Given its chequered history, it's good to see FreeHand prospering on both the Mac and PC platforms. Under the guardianship of both Adobe and Macromedia, it has gone from strength to strength.

Release 5.0 for Windows 95 is a native 32-bit product, so it has obvious advantages in terms of speed and ease of use. You can run it under Windows 3.1 with Win 32s installed.

FreeHand 5.0, like Illustrator, is a pedigree professional design product — hence the price. Its main competitor continues to be Illustrator and, on Windows platforms, CorelDraw 6.0. It provides all the tools you need for professional design and output, with the emphasis on output: like Illustrator and Corel, the assumption is that your illustrations are intended, either directly or via a page layout program, to be printed on a commercial colour press.

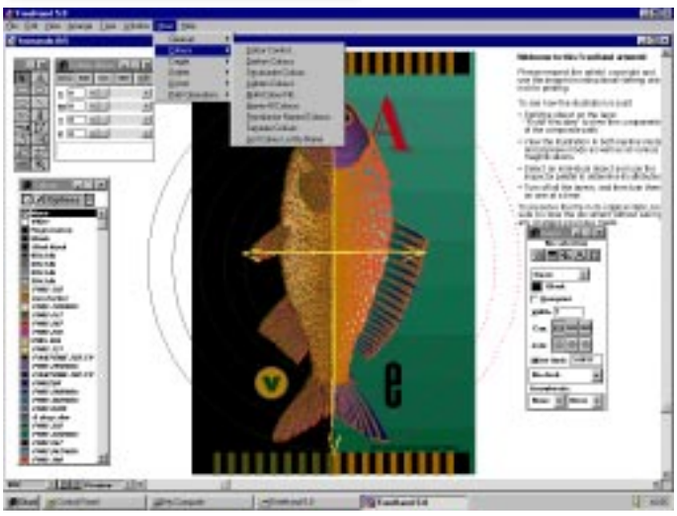
In addition to the provision of a well-equipped set of tools for the purpose, FreeHand 5.0 possesses a user interface to die for. It's simply brilliant. FreeHand introduced drag and drop features on the Macintosh in version 4.0. This has since been refined to the point that on this Windows version, the application of colour and fill styles to objects could not be easier.

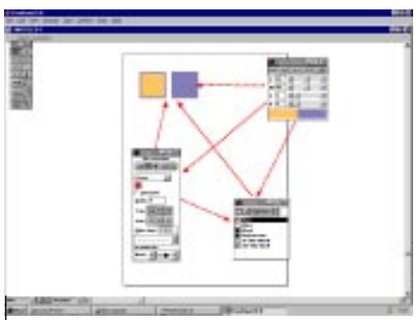
The FreeHand interface operates around a number of free-floating palettes. The palettes provide access to different resources accessed from a range of tool buttons at the top.

The Inspector palette has five buttons: objects, fills, strokes, type and measurements. Selecting one of these configures the palette accordingly. So, when you press the fill button, you can choose from a pull-down including basic, custom, graduated, pattern and other kinds of fill style. The stroke button allows you to specify colour, stroke width, cap ends, type of join, mitre angle, dash style and arrowheads.

Before you can specify a colour for fills and lines, however, you need to create it. This is done using two palettes: the colour mixer and the colour list. The latter can be used to add pantones and other colour libraries and to convert spot to process colours and vice versa.

The colour mixer provides CMYK, RGB and HLS models, and a tint palette which automatically creates tints from your choice of colour in ten percent increments. Once you have created a colour — using, say, the four-colour CMYK model — you can add it to the colour list and this is where the drag and drop fun starts. You simply pick up the colour swatch, drag it to the colour list and it's added. A name indicating its composition (e.g. 50c 50m 0y 0k) is automatically added and displayed in italics to show it's a process colour.





Top *Many Xtras make light work. These plug-ins give unprecedented control over items like colour attributes and path operations*
Above *You can drag and drop colour swatches between palettes or directly onto objects to change fill and stroke colours. Process and Pantone colour tints can be created quickly this way*

You can drag colour swatches from virtually any palette to any other or directly onto objects on the page. So you can mix up a colour on the mixer and drag it to the colour list, or directly onto an object, or onto the inspector palette with the stroke button depressed in order to change the stroke colour of all selected objects.

You can select a Pantone colour from the colour list and drop it onto the colour mixer with the CMYK button depressed. This will tell you its process colour equivalent specification. You can then press the tints button and, for instance, drag the 50 percent swatch back onto the colour list. This is a really excellent method to mix and match colour on a computer.

FreeHand 5 additionally supports plug-in technology in the form of "Xtras". A number of useful tools are incorporated in these, consisting of some for colour experimentation and a suite of path operators including intersect, punch, transparency and union.

Macintosh users are equally divided when it comes to taking sides between FreeHand and Illustrator: on the Macintosh, both offer comparable levels of functionality. Until Illustrator catches up with a 32-bit version which includes more of those features currently available on the Macintosh, FreeHand is simply streets ahead.

PCW Details

Macromedia Freehand 5.0
Price £450 (RRP); upgrade £99
Contact Computers Unlimited
0181 200 8282

Good Points Superb user interface. "Xtra" plug-in modules.
Bad Points Expensive.
Conclusion The obvious choice for professionals.

GSP Designworks 3

Personal Computer World EDITOR'S CHOICE

Following a restructuring at Cambridge-based GST last year, what used to be known as GST Designworks 2 has had its initials modified and is now known as GSP Designworks 3. The name, of course, isn't all that has changed.

You get two CD-ROMs: one with the program and associated bits and pieces, and another with a collection of 100 royalty-free photoCD images. The bits and pieces are actually quite a substantial collection of fonts, templates and clipart, in addition to a border creator application and various other utilities.

If you install the lot, it will take up 37Mb on your hard disk including 8Mb for the fonts and 13Mb for the clipart. The actual application weighs in at just under 4Mb. You can choose not to install it all and you can even run it off the CD if you are really pushed for space.

We didn't have much luck installing Designworks 3 under Windows 3.1. Whenever we tried to run it, regardless of the installation configuration we got a damaged file error. Contrary to all expectations it installed without problems under Windows 95 and ran like a dream.

At first glance, the interface doesn't look a whole lot different from the GST product we looked at more than a year ago. The differences are subtle, but significant.

Firstly, the tools and controls have been reorganised into a toolbox and five toolbars. These toolbars can be viewed in various sizes by expanding or collapsing them using arrow buttons at the edge. You can also float or dock them at the screen edges. The toolbox contains six basic editing tools — a pointer, text tool, box tool, pencil, scale and magnifier. The pencil tool allows you to scribble freehand and turns the resulting squiggly lines into smooth vectors with bezier handles. Clicking on the small arrow button opens up the button to reveal a panel of bezier curve drawing tools. Alternatively you can click on the arrow button at the bottom of the toolbox and the whole thing expands to show all the tools.

In addition to the toolbox there is a General tools bar, transform tools, align tools and a final box which toggles between object and text tools, depending on whether you have the Text or pointer tool selected. Having the tools organised in this way means you can get things done more quickly than by using menus, and you always know where things are — providing you can remember where you put them. Most users will quickly settle on a setup with which they are happy and leave it that way.

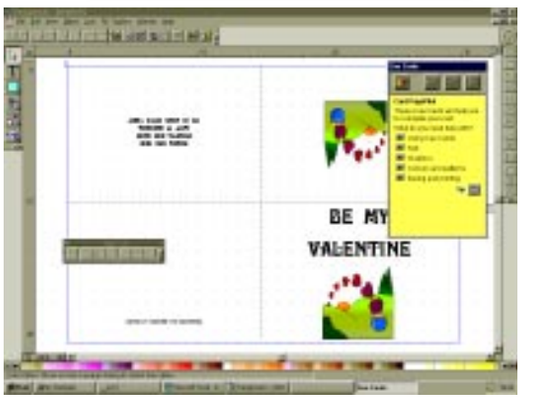
The toolbars are cleverly designed so that the least used tools are on the expanded section of the bar. The transform toolbar, for instance, has horizontal and vertical reflect, rotate and scale options on the first stage and lesser-used skew options on the extended section.

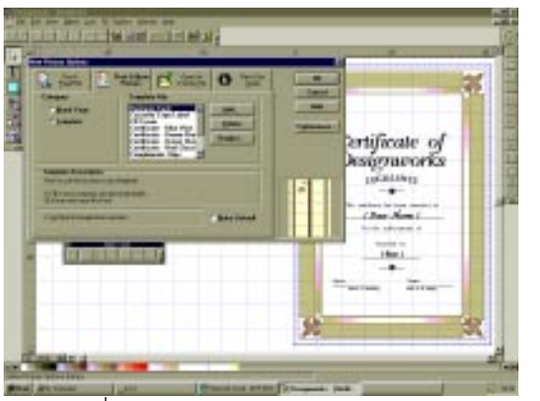
Another new addition is PagePilots, a more imaginatively titled version of Microsoft's Wizards. These can guide you through the creation of standard documents such as certificates. PagePilots and the collection of templates won't win any design awards, but they will save you time in setting up standard layouts for basic design needs. You could always use these as a starting point, if nothing else. GST can supply pre-printed certificate paper to be used in conjunction with the certificate page pilot. This would be ideal for schools and other educational establishments.

There are lots of other small touches which add up to a big improvement in what was already a first-rate budget package. Dialogues are split into colour-coded tabbed cards, giving you more options and making them easier to follow. There's generally more help in the form of balloons, hints, status lines and cue cards. Pantone support has been updated to include more colours, coated and uncoated palettes and printer calibration.

Other extras include a border creator, a screen grabber called snapshot, a font utility which organises fonts into groups, a photoCD browser and keypad utility.

Existing users will need no convincing about Designworks' strengths and this new version is well worth the upgrade. Whether you're sticking with 3.1 for now, planning a future upgrade, or have already made the great leap forward, Designworks will fit in nicely with your plans.





The interface has been updated to make the most of Windows 95. Dialogue boxes are organised as colour-coded tabbed cards with previews for templates. The arrows on the toolbars can be clicked to display an extended palette. PagePilots help you to produce reasonable-looking results in a matter of minutes

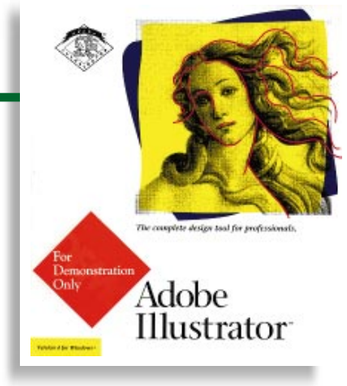
PCW Details

GSP Designworks 3

Contact GST Technology
01480 496789
Price £39.95

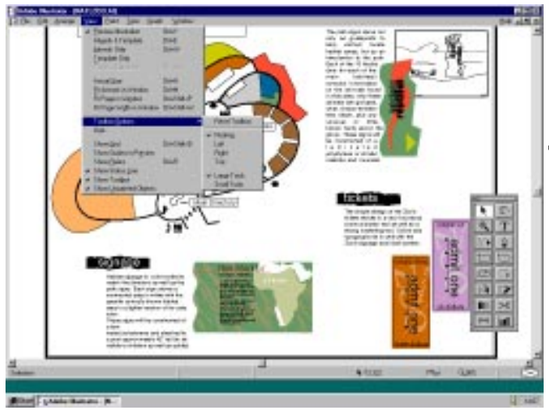
Good Points Lots of help for the novice designer. Excellent all-round Windows 95 package.
Bad Points None.
Conclusion The best budget buy around.

Adobe Illustrator 4.1



Along with its rival, Macromedia FreeHand, Adobe Illustrator is an immigrant from the Mac world. Following many revisions it is now a mature product that, on the Mac at least, occupies a strong position as one of the most popular illustration packages for design professionals.

You get quality and quantity in the Illustrator box. There are seven pieces of substantial documentation. Four of them apply to Illustrator itself, the remainder explain the additional goodies. These are Adobe Type Manager, Type Align and Streamline — three substantial packages in their own right.



It's not a Windows 95 native application, but Illustrator allows you to move the toolbar around

Adobe Type Manager (ATM) is a font utility, used in conjunction with Adobe Type 1 fonts, to produce high quality screen fonts using the Type 1 outline (or printer) fonts. ATM lets you print Type 1 fonts on non-PostScript printers and it supports Adobe's multiple master font technology which creates facsimile fonts so you can view documents as they should appear — even if you don't have the fonts, on your machine, with which they were created.

Type Align lets you manipulate and distort text to create special effects. It works only with Type 1 fonts and you must have ATM installed.

The remaining addition, Adobe Streamline, is a trace utility that converts bitmap images into PostScript vector format. Most vector drawing packages have a trace tool of some description but Streamline goes far beyond what any of them offer. It offers a number of conversion options so you can fine-tune the process for very good results. It will convert not just line-art bitmaps but greyscale and colour ones, too. The results have to be seen to be believed and can save hours of laborious tracing of logo scans and the like.

Illustrator was one of the first proponents of the bezier curve drawing method and still relies heavily on the click and drag method of curve creation as a basic drawing tool. One tool does all the work, creating straight lines or curved ones depending on whether you click or drag. The shape of line segments can be subsequently edited by dragging handles with anchor points at a tangent to the curved section. It sounds complicated, but after 20 minutes' practice with the help of the tutorial it comes almost naturally.

There's a comprehensive suite of tools for drawing ready-made objects such as rectangles, rounded-corner rectangles and ellipses. You couldn't ask for more transformation tools: scale, reflect, rotate, shear, they are all here.

What's special about Illustrator is not the tools themselves, which are common on packages costing a lot less, but the way in which they work and the results produced. All the transform tools can be operated via a dialogue box where you can input exact specifications. With the scale tool, for instance, you can specify a percentage enlargement or reduction and choose to preserve line weights; an important option often overlooked in other packages. When transforming, you can also opt to copy: a powerful combination for producing radially repeating elements with the rotate tool, or concentric circles with the scale tool.

Fill and stroke functions offer the kind of versatility you would expect from a professional package. Colour matching systems include CMYK and Pantone, as well as some less commonly used ones such as Toyo, Focoltone and Trumatch. Everything is implemented with a view to commercial printing and there are options to independently overprint an object's stroke and fill colours.

The overprint option is also used to manually create spread and choke traps to compensate for misregistration of colour plates during printing.

Illustrator's text capabilities (the subject of much criticism in early releases) are now a match for anything the competition has to offer. Version 4.1 has text-formatting facilities that wouldn't look out of place in a layout package: these include Truetype support, text within objects, wrapped around objects, linked text boxes, text on a path, and transformed text. Leading control, kerning and tracking, alignment, vertical shift, and conversion to paths are included, too.

Accomplished as it is, Illustrator still lags behind its Mac sibling. Mac users have access to a range of third party plug-in filters providing all sorts of specialised transforms and effects. Version 5.5 plug-ins provide Mac users with a wide range of filters. This, and the absence of a full 32-bit Windows 95 version, needs to be addressed soon if Illustrator is to become as respected on the PC as it is on the Mac.

PCW Details

Adobe Illustrator 4.1
Price £344 (street)
Contact Adobe 0181 606 4000

Good Points Professional in every respect. Ideally suited to pre-press output.
Bad Points Lagging behind the Mac version.
Conclusion Good, but wait for a full 32-bit version.

Micrografx Windows Draw 4.0

Windows Draw 4.0 is not one application but three. The Micrografx budget graphics suite has undergone major revision to take advantage of Windows 95 as part of the company's market refocus. The aim of Windows Draw is clearly to compete with the budget competition by offering an integrated suite as opposed to a single package. The product aims to appeal to the very broad base of Microsoft Office users by making the interface closely reflect that of Office.

As well as Windows Draw 4.0 the CD includes Photomagic (a bitmap image-editing application), a 10,000-piece clipart library, 250 TrueType fonts, 150 templates and the ABC Media Manager for browsing and placing clipart graphics.

If you've used Word, the Windows Draw interface will look familiar. The question is, how important is familiarity? It's all very well being able to recognise which buttons are for file management, cutting and pasting, printing and spellchecking, but what about the rest of them? A graphics package doesn't have a great deal in common with a word processor so why should the interface look the same? Once you get past the first few buttons there's little that's intuitively obvious.

Novice users will discover that templates are a good source of ideas. Like most of the Windows 95 native applications Draw makes use of tabbed dialogue boxes to present categorised template choices. Options include publishing, diagrams, celebrations, fun, games and sports. The lack of preview thumbnails is irritating because you can't see the template style without opening the file. The whole idea of templates is that you make a choice from everything that's available and it's extremely tedious to have to go through the whole lot.

When you start with a template it opens with a selection of connected clipart graphics in the ABC Media Manager, plus a cue card with relevant hints. So if you choose one of the children's certificates you get a selection of stars and rosettes in the Media Manager. The cue card will offer the good advice that you should stick with a few well-chosen fonts, browse the borders clipart collection for alternatives and keep the background on a different layer.

The quality of the templates and clipart is variable. With a few exceptions, the general rule with any clipart collection is that you're lucky if five percent of it is usable, and the Windows Draw collection is no exception. It was largely the same story with the templates; like the clipart, if you're prepared to look you can turn up some really nice material.

Micrografx has padded it out with items from earlier collections; there's a comprehensive collection of pipe fittings for instance. And that reminded me about the wide variety of toilet art included in the Designer 4.1 technical edition. This proved to be a good opportunity to check out Media Manager's search function and, sure enough, searching the entire collection for "closet" quickly reaped rewards in the form of line-drawn lavatories. This keyword search facility is certainly a useful way of locating clipart and compensates for the lack of template previews.

Spot the difference between Windows Draw and Microsoft Word: it's familiar, but is it appropriate for a graphics package? The Media Manager loads appropriate clipart for your template selection; dinosaurs are okay but toilets should have been cleaned out

It would be a mistake to write off Draw because its clipart and templates aren't up to scratch. It does provide a high level of functionality for a budget package. There are more than 30 new drawing tools in addition to the previous edition's geometric and freehand shape and line tools.

Another good new addition is layer control. You can make layers invisible, non-printing, and lock them from within the layer manager. There are also diagramming tools: label text and connector lines, and coolShapes. The latter provides a one-step method of drawing more complicated shapes such as starbursts and 3D polygons

Outwardly, Windows Draw has a lot to offer. It's the cheapest suite of graphics packages you're likely to find but Micrografx has made a mistake with slavish adherence to the Microsoft Office interface. Drawing isn't like word processing, and the Draw interface is its biggest problem.

PCW Details

Micrografx Windows Draw
Price £39.95
Contact Micrografx 01483 747526

Good Points Low price. Wide range of drawing tools, includes Photo Magic image editing package.
Bad Points Microsoft Office compatible interface.
Conclusion High on content, low on usability.

Micrografx ABC *Graphics Suite*

Micrografx has bundled its vector draw product, Designer, with its highly capable bitmap image editor, Picture Publisher, added some specialised applications and utility software plus a big clipart and image library. The integrated suite contains updated versions of all the individual applications: versions 6.0 of Designer, Picture Publisher, ABC Media Manager and ABC Flowcharter. All are native 32-bit Windows 95 applications, so have all the speed and functionality advantages that implies.

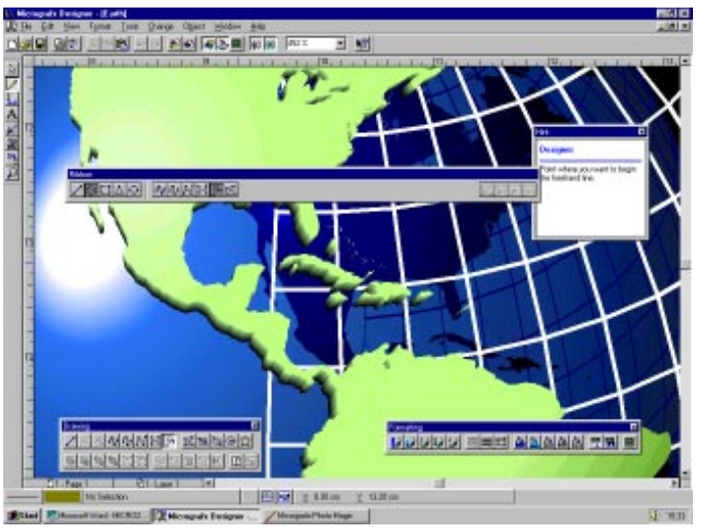
The Designer interface mirrors that of Word and other MS Office applications. It positively groans with toolbars. You can switch them on or off and like all Windows 95 applications you can put them pretty much where you like. There are two visible toolbars in addition to the standard one.

The toolbox contains eight basic tools for drawing, text editing and painting. So depending on which tool is selected, a context-sensitive ribbon displays a selection of modifiers. This is essentially the way things worked in Designer 4.1 and it works well, providing a versatile range of options with each of the tools.

Selecting the draw tool, for example, pulls up the draw ribbon with five buttons at the extreme left. These give you the option of simple lines, compound lines, rectangles, polygons or ellipses. Selecting any one of these creates an additional palette of modifiers. No tool is too humble to have half a dozen modifier buttons. So if you select the compound line tool, you have six choices of drawing method including jointed straight lines, B-splines, Bezier curves and freehand. The ellipse tool modifiers provide many different ways to draw an oval: you can drag diagonally, mark the height and width or the diameter and even draw pie segments. If this seems like button overkill, it's not. It's always useful to have specialised options for drawing shapes because it saves time not having to do it manually.

Designer has balloon help as well as a hint window which gives a brief description of each button's function, so you always know where you are.

Designer can be used to produce and display presentations and has elementary slide-sorter functions, transition effects, timing controls and the ability to save slide shows in a standalone format. However, if this really is targeted at Office users, one wonders whether Micrografx wouldn't have been better off using PowerPoint.



Top *It looks more complicated than it is; the five buttons on the left of the draw ribbon give you the option of simple lines, compound lines, rectangles, polygons or ellipses*

Above *You're still stuck with the Office look, but because there's a much wider range of tools it's not such a problem. Clipart can be dragged and dropped from the Media Manager on the left*

As well as providing a transparent means of file conversion, the ABC Media Manager is the quickest way to get your hands on the 30,000-odd clipart and photo images on the two content CDs. The Media Manager provides drag and drop access, in and out, as well as keyword searching, so you can add your own work to it and find it again without too much trouble. With few exceptions, the photo images on the CD are all small, screen resolution images and not much use for commercial printing.

Designer has a good range of line and fill styles accessed from a toolbar, and has support for RGB and CMYK colour models as well as a Pantone colour library. There's no support for printing even spot colour separations though, so if your design plans include commercial colour printing, you'll need to look elsewhere. But there's nothing to stop you exporting the document to a page layout package that provides colour separations.

As with its budget package, Windows Draw, Micrografx is attempting to beat the competition on value for money by offering a high content, while simultaneously attracting MS Office users by adopting elements of the Office interface in its own applications. In terms of content there's no denying you get a lot for your money, but you get more from the Corel box.

PCW Details

Micrografx ABC Graphics Suite

Price Under £250

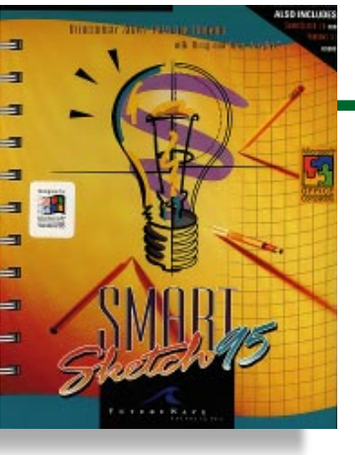
Contact Micrografx 01483 747526

Good Points High degree of functionality, easily accessed via a well-designed interface.

Bad Points No support for colour separations.

Conclusion Okay if you're keen on the Microsoft Office look. Home users are better off going the budget route, professional users in the other direction.

SmartSketch 95



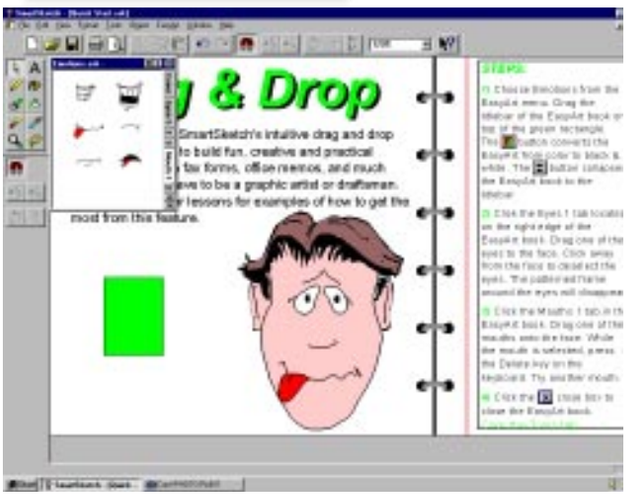
SmartSketch 95 is unlike anything else reviewed here. Illustration packages generally fall into one of two categories: bitmap editors such as Adobe Photoshop and Micrografx Picture Publisher, or, like the other packages in this review, they deal with vector graphics. SmartSketch 95 combines elements of both approaches.

The object, according to SmartSketch, is to combine the ease and simplicity of pencil and paper sketching with software vector objects. If the package illustrations and tutorial templates are anything to go by, it has succeeded. They have a kind of cartoon quality about them which is more suggestive of quick freehand sketching than a computer-produced illustration.

For Windows 3.1 users, the package also includes SmartSketch 1.0. The most important differences between the two versions are look and speed. SmartSketch 1.0 lacks the floating and dockable toolbars and the alternative vertical and horizontal toolbar layouts. It lacks, too, the advantage of 32-bit processing so some editing operations and screen redraws can take up to twice as long. Other things you'll miss out on include certain import and export formats, new line styles, improved text handling, better display of colours on 8-bit displays and the right mouse button menu. Taken individually, these are all things you could probably live without but collectively they add up to a lot.

What the marketing people would call SmartSketch's unique selling point is its ability to turn rough scrawl into smoothly curving or dead straight lines. It can do this either as you draw, or as an afterthought. The toolbox contains a weird hybrid of object and bitmap editing buttons. Selection of any particular tools produces a palette of modifier buttons below. The main drawing tool is the pencil, which appears with a modifier pop-up button and line width and style windows. The pop-up effectively turns the pencil into six tools. Three are plain old object tools — rectangle, oval and line. More interesting are the straight and smooth modifiers which take your wiggly lines and smooth them out.

You can apply further smoothness with the pointer tool which has four modifiers — rotate, scale, straighten and smooth. The two latter can be applied to selected parts of the image as many times as you like to further even out inconsistencies in your line work.



Above *SmartSketch is quick and easy, with an excellent interactive tutorial*

Left *Using the modifiers enables selective erasure*

The ink brush, paintbucket and eraser tools build on this mix of bitmap and vector strengths. In normal mode the eraser, like any bitmap or real eraser, simply wipes out whatever falls under its path. But using the modifier enables selective erasure. You can choose to erase just the lines in a drawing, only the fills, selected fills only, or just the bordered area in which you start erasing. Similarly, the paintbrush can slap on the pigment in the conventional manner or more selectively, painting fills only, lines only, behind the image, or just selected areas.

Because of the unique way SmartSketch deals with objects, you need to rethink your approach if you are used to creating illustrations with "non-destructive" vector packages. (In a non-destructive package, when you place one vector object on top of another, the top object doesn't destroy what's underneath.) In SmartSketch, if you draw a vertical line through a circle and overwrite the part of the circle underneath, the line segments the circle and vice versa. The end result is that you now have five independent elements — the two segmented halves of the circle and three connected lines.

It's not always useful to have overlapping elements interact in this way and by grouping things you can make them behave like ordinary, non-destructive vector objects. You can move them on top of things, then take them off again, revealing unchanged what was below.

SmartSketch is everything it promises on the packaging blurb. For quick and easy sketching it's ideal. If your drawing's not up to much there are palettes of "EasyArt" which you can drag and drop onto the page. SmartSketch won't suit everyone, because it doesn't have the precision or the breadth of vector drawing tools and transforms available in conventional packages, but it's smart, quick and a lot of fun.

PCW Details

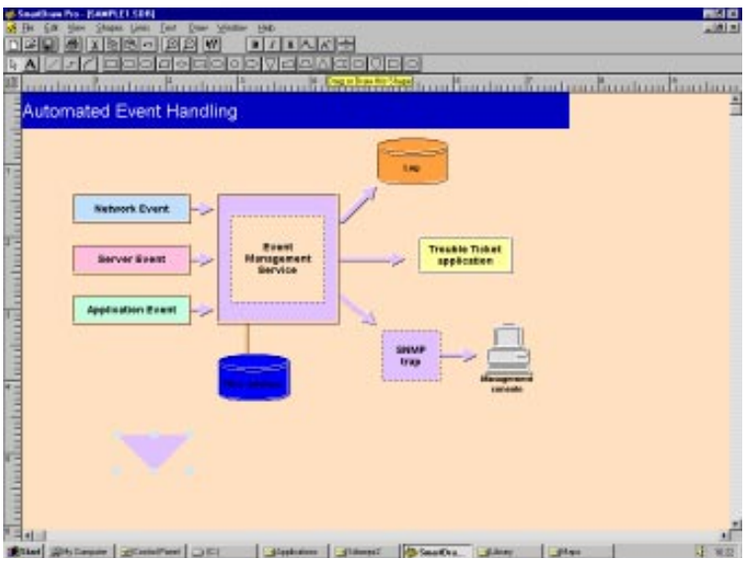
SmartSketch 95
Price £64.99 (incl VAT and postage)
Contact CGS ComputerBild
0181 679 7307

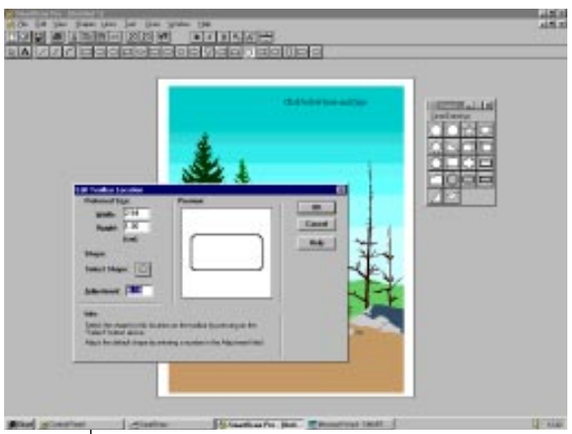
Good Points Quick, easy, different and lots of fun.
Bad Points Lacks the precision and versatility of more conventional packages.
Conclusion Great for quick and easy art-like cartoons.

SmartDraw Pro

SmartDraw Pro version 2.01 is the second release of a product introduced in late 1994. The pro version reviewed here has the same functionality as what you'd presumably call the amateur version, but with additional features including support for thousands of objects. Since November '95, both products have been available for Windows 95 and 3.1.

The three-disk install takes about ten minutes and creates a program icon for you. Minimum requirements are a 386 running Windows 3.1 and the full install occupies around 6Mb on your hard disk including diagrams, flyers, frames and clipart library. When you first launch SmartDraw Pro you are presented with a welcome dialogue which invites you to create a new drawing, open an existing one, select a template or read through a list of hints. A details button pulls up the relevant Windows help file if you want to know more. When you become an advanced (or should that be professional) user you can turn off the welcome.





Top *This sample diagram is about as sophisticated as you're going to want to get with SmartDraw*

Above *Adjust the default shape by entering a number in the Adjustment field. Fine, as long as the number is between 0.1 and 0.4 and all you want to do is change the length of the top and bottom lines*

The interface initially looks fairly inoffensive, but after a short while you get the impression that it's more of an early exercise in object-orientated programming than a designers' tool. Eighteen predefined shape tools hang on a ribbon across the top of the page — why so many? There are triangles, ellipses, parallelograms, arrows, diamonds, hexagons and a whole range of flowchart symbols.

Double clicking on any of these tools pulls up an adjustment dialogue box. Here, you can change each tool button from a selection palette of 24. The palette is the same for each tool button, so why have 18 when one gives access to everything. Six would be plenty.

The next disappointment was the inflexibility of the tools. Many of the tools offer no adjustment whatsoever, and those that do are severely restricted. You can, for example, adjust the radius of the corners on the round-cornered box tool, but only between the default value of 0.1 and 0.4, though what these figures actually mean is anyone's guess. If you try to enter a value greater than 0.4 it simply flips you back to the default.

The hexagon tool is similarly baffling. I expected to be able to adjust the number of sides, but changing the figure in the adjustment box simply shortened the length of the top and bottom edges. A palette of "smartdrawings" provides more sophisticated symbols, including access to a library of clipart images, but there's still no easy method of changing the fundamental shape of these.

Speaking of fundamentals, SmartDraw Pro lacks one or two others that are usually considered basic equipment on even budget packages these days. The first is a bezier drawing tool. The only curves you'll see in a SmartDraw illustration will be on circles and ellipses. There is an arc drawing tool, but this doesn't really make up for the lack of a bezier. There are no transformation tools either. The inclusion of a rotate and reflect tool would have made a lot of the other tools redundant.

To be fair, SmartDraw Pro isn't aimed at professional designers, rather at home users who want to quickly produce diagrams and schematics. It's not expensive, but there are equally budget-priced packages that have better functionality, better interfaces and more comprehensive clipart and template libraries.

PCW Details

SmartDraw Pro
Price £34.95
Contact The Thompson Partnership 01889 564601

Good Points Low hard disk requirements. Good selection of flow-charting symbols.
Bad Points Horrible interface.
Conclusion Both Micrografx Draw and GSP Designworks 3 are much better and cost only a fiver more.

TABLE OF FEATURES

Product	Adobe Illustrator 4.1	Macromedia FreeHand 5.0	CorelDraw 3.0	CorelDraw 6.0	ABC Graphics suite
Supplier	**Adobe**	**Computers Unlimited**	**Channel Market Makers**	**Channel Market Makers**	**Micrografx**
Telephone	0181 606 4000	0181 200 8282	01703 814142	01703 814142	01483 747526
Price	Street £344	RRP £450 (upgrade £99)	RRP £79 (CD); street £42	Street £395	MRP under £250 (upgrade £99)
Min system requirements	386, 4Mb RAM, Windows 3.0 12Mb disk space	486, Windows 3.1 with Win32s 12Mb RAM, 25Mb disk space	386, Windows 3.0, hard drive	386, 8Mb RAM, Windows 3.1	386, 8Mb RAM, Windows 3.1 15Mb disk space
Windows 95 version	❍	●	❍	●	●
CD-ROM	●	●	●	●	●
Multiple pages	●	●	❍	●	●
OLE2 support	●	●	●	●	●
Layers	●	●	●	●	●
On-line help	●	●	●	●	●
Trace	●	●	●	●	●
Blend	●	●	●	●	●
Graphs	●	❍	●	●	❍
Pressure sensitive tool support	●	●	❍	●	❍
Text on a path	●	●	●	●	●
Convert text to paths	●	●	●	●	●
Kerning	●	●	●	●	●
Colour models	CMYK, Pantone, Toyo, Focoltone, Trumatch	CMYK, DIC, Focoltone, Toyo, Trumatch	CMYK, RGB, HSB, Trumatch	RGB HLS CMYK, Trumatch, Focoltone	RGB, HLS, CMYK
Colour separation	Spot & CMYK separator s/w	Spot & CMYK	Spot & CMYK	Spot & CMYK	❍
Formats supported					
BMP	●	●	●	●	●
CGM	●	●	●	●	●
CDR	●	●	❍	❍	●
PICT	●	❍	●	●	●
DXF	●	●	●	●	●
DRW	●	●	●	❍	●
EPS	●	●	●	●	●
TIFF	●	●	●	●	●
KEY ● Yes ❍ No					

TABLE OF FEATURES

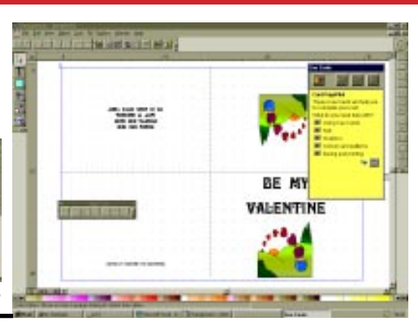
Product	GSP DesignWorks 3	SmartSketch 95	SmartDraw Pro	Windows Draw
Supplier	**GST Technology**	**CGS ComputerBild**	**Thompson Partnership**	**Micrografx**
Telephone	01480 496789	0181 679 7307	01889 564601	01483 747526
Price	MRP £39.95	£64.99	£34.95	MRP £39.95
Min system requirements	386, 4Mb RAM,Windows 3.1 5Mb free disk space	386, 4Mb RAM, Windows 3.1, 1.5Mb disk space	386, Windows 3.1 —	386 6Mb RAM, Windows 95, CD-ROM, 15Mb disk space
Windows 95 version	●	●	●	●
CD-ROM	●	❍	❍	●
Multiple pages	❍	●	❍	❍
OLE2 support	●	●	●	●
Layers	●	❍	❍	●
On-line help	●	●	●	●
Trace	●	●	❍	❍
Blend	●	❍	❍	●
Graphs	❍	❍	❍	❍
Pressure sensitive tool support	❍	●	❍	❍
Text on a path	●	❍	❍	●
Convert text to paths	●	●	❍	❍
Kerning	●	●	❍	❍
Colour models	RGB, HLS, CMYK, Pantone	None	None	None
Colour separation	Spot & CMYK	❍	❍	❍
Formats supported				
BMP	●	●	●	●
CGM	●	❍	❍	●
CDR	❍	❍	❍	●
PICT	❍	❍	❍	●
DXF	❍	●	❍	●
DRW	❍	❍	❍	●
EPS	●	❍	❍	●
TIFF	●	❍	●	●
KEY ● Yes ❍ No				

Editor's Choice

After much debate it came down to two choices: one for the budget packages and one for the professionals. GSP Designworks 3 is easy to pick out from the pack because it excels in every respect. The interface and tools are a pleasure to look at and work with, and the Windows 95 release has built on the strengths of the existing package. Built-in help and support is very good, making it an excellent choice for novice designers. Added to this, you have good support from an easily contactable British company.

At the other end of the scale, the choice is a little more difficult. Adobe Illustrator, although a top Mac product, fails on two counts — lack of full Windows 95 support and the essential plug-ins which so extend its capability. CorelDraw 6 has also built well on version 5, with intelligent Win95 additions to the interface and an unsurpassed bundle of applications, fonts and clipart. But for professional designers the choice should undoubtedly be FreeHand 5, which brings to the PC every ounce of functionality it provides Mac users. It has a supremely intuitive interface, and cross-platform compatibility and expandability. Interestingly, it compares poorly on extras like fonts and clipart — all you get is a first class design and illustration package.

GSP Designworks 3



CorelDraw 6.0 (left) and FreeHand 5 (above)

Tel-it like it is

Tel-Me cuts out the middleman. With this new online information service, your fingers don't have to do the walking.

FROM THE OUTSET, Tel-Me exudes a rare quality. A well-designed, purposeful piece of software that does what it sets out to do with economy and elegance.

A conversation with the chief executive of PhoneLink, the British company behind Tel-Me, revealed that its programmers are not the archetypal long-haired, earringed geeks of software lore but business-minded individuals who program for their intended customers. And it shows.

Getting down to business

Tel-Me is an online information service targeted squarely at the business community. Depending on which services you subscribe to, Tel-Me can offer up-to-the-minute information on company profiles (two services to choose from), as well as British Rail travel and AA travel services, as well as PA news, Thomson Business Finder, Thomson Classified, OS Mapper, Royal Mail postcoder, the weather and an Internet email facility.

None of this is free, of course. PhoneLink makes its money from the initial sale of Tel-Me software and then from each service enquiry that users make. To save you money, PhoneLink endeavours to keep online time to a minimum; you are only online when you send an enquiry to the server and it sends back the answer.

Tel-me is based on cutting out the middleman. For instance, telephoning British Rail travel enquiries means waiting for someone to tap your travel details into a computer, so why not save time and do it yourself?

From install, the neat welcome messages show that PhoneLink cares about interface design and user interaction. You can choose to link to the Tel-Me server either by the fast modem that PhoneLink can provide, or via a LAN using TCP/IP. I chose the latter, but the modem worked equally well.

Setup and install worked without a hitch and everything installed correctly into Windows 95. Using Windows 95 means that you can run Tel-Me enquiries in the background.

As long as the IP connection via the LAN is already set up correctly there is no problem with launching Tel-Me directly from the desktop shortcut. You are asked for your password each time you log on which, although tedious, does maintain security. But then it also asks you every time how you wish to connect — and this could be avoided. But once in, you are presented with a simple interface and a series of menu buttons each representing the various services on offer. The interface is consistent throughout each service, making Tel-Me easy to learn. Only individual services differ in the options available.

Be properly addressed

Always use the postcode? Absolutely. This part of Tel-Me accesses the Royal Mail's Postal Address File (PAF) database of 25 million UK business and residential addresses.

For searching, Tel-Me presents a form for address details, locality and (strangely) postcode. It is fussy about the number of details you enter for the search: a single street name search such as Broadwick Street, London failed to produce the right result. But if you know the complete name and address Tel-Me has no problems coming up fast with the answer. It gives you a location map, too, and full PAF details.

As with all the separate parts of Tel-Me, it only goes online once you hit Return. It is probably not an indispensable service but everybody needs a postcode at some time or other, and most people don't know the Royal Mail number which provides the same service.

email

Every buyer of Tel-Me is given a personal Internet address, based around a TelMe.com domain. Users can then configure their own sub-domain, such as pcw.TelMe.com and give themselves a user name. You then have a full send and receive Internet email facility.

Using Tel-Me as an email facility is highly efficient. All emails, in and out, are logged in the right-hand column where they can be saved or deleted, although it would be better if email could be logged separately to provide instant access to messages. In addition, the Tel-Me log can get a little unwieldy if left unmodified after many sessions.

At the click of a button, adequate provision is made for file enclosures and these are automatically uuencoded.

Regular email addressees can be added to a log for instant access and right clicking a name in the send list will give you their full email address, phone number and organisation (if appropriate) — a useful touch. There is the option to scan for new mail on startup and other effective options include setting a font style to read and compose mail, as well as a means of setting your sig block. But it would be nice to be able to despatch multiple emails from a single send.

Overall, the email facilities cannot rival dedicated packages such as ccMail or Microsoft Mail, but that is not necessarily a bad thing. Tel-Me treats email as a simple communications technique with just the right degree of database facilities. And it works.

Just one thing; why do the icons for addresses look like French spies?

PA News

Taking a feed direct from the Press Association, this part of Tel-Me is worth its weight in gold for anyone who needs constant access to breaking news.

When you first hit the PA menu button you are offered a whole raft of options: All News, Home (with subdirectories: court, crime, economy), Financial, Foreign and Sports. In all there are nine news categories from which to choose. On top of these, there are further search profiles such as headlines and word search (exact or partial).

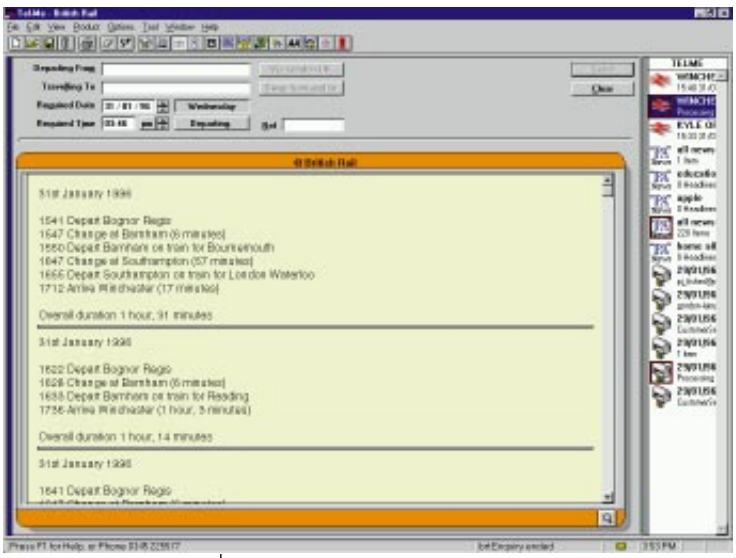
When you have decided what you are interested in, you can set the search for previous hours or minutes. However, set it too short and you won't get any news; set it too long and you will get more news than you need.

I accidentally set it to All News for the past 24 hours which was a BIG mistake, but it did prove that Tel-me is robust. When the process was prematurely stopped, Tel-me refused to quit until it had shut down the procedure properly. That's good programming.

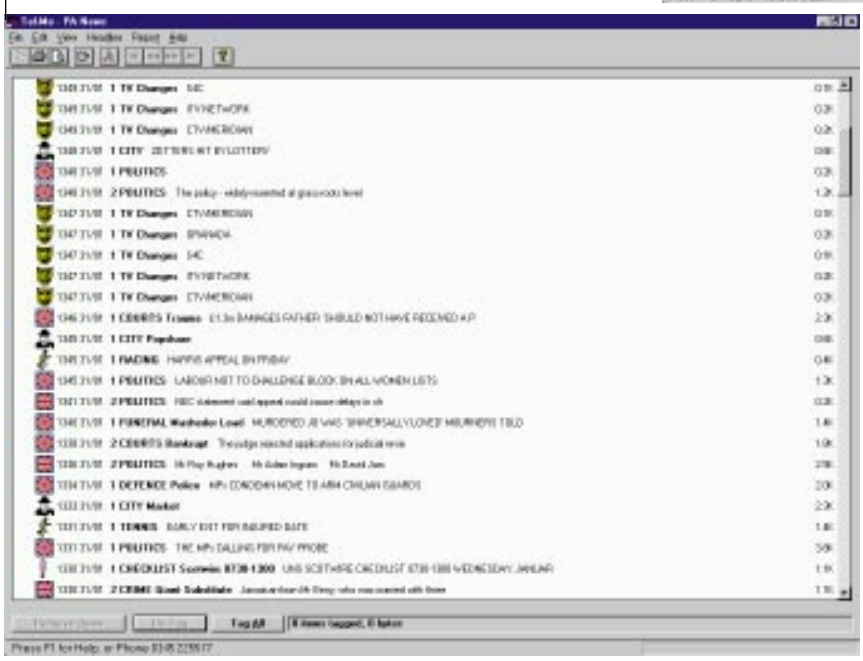
PA News is a two-step process: the first send finds all the stories that fit your parameters; the second search finds the text of the news items you tag to read. This saves online charges and allows you to filter what is important. The default font for news is Courier, but as with email this can be changed to any font installed on your system.

Looking at the options, there appears to be a way of setting a user profile so that news feeds can be customised, but this proved not to work.

Many Web sites now provide news feeds but you have to stay online to read them — with Tel-Me you don't. It is a pity that Tel-me does not allow you to cut and paste news stories into other applications, but that may just be a copyright issue.



PA News presents all the stories, complete with icons, for you to browse. Tag stories to get the full text from the Tel-Me server

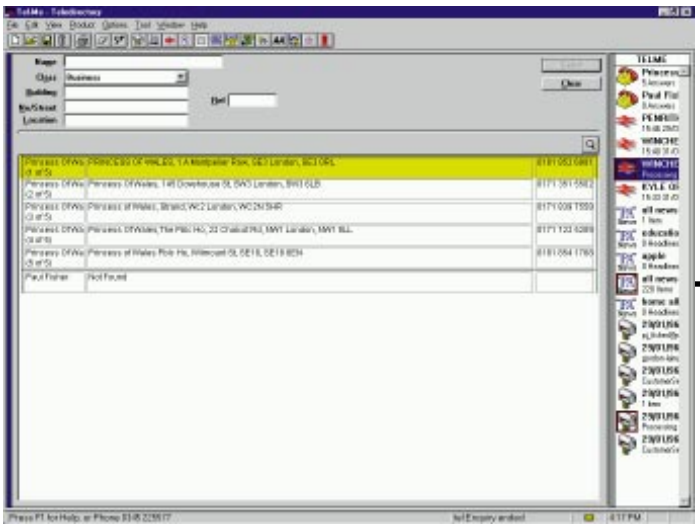


If you want to go to Winchester from Bognor — and who wouldn't? — Tel-Me presents you with all the information you need

British Rail

Like the poor, British Rail will always be with us, privatised or not. Inter-City services are often a better travel option than the car but planning rail travel can be a nightmare. We've all experienced the pain of BR enquiry desks at some time or other — Tel-Me gets around this.

You type in start stations and destinations and Tel-Me prompts you with suggestions as you type. For example, type in WAT and it will suggest Watford, Waterloo or Waterlooville. This is a one-shot enquiry, so you get instant travel information. It comes up with departure times, any changes necessary



There's more than one Princess of Wales in central London. The other five are all pubs where, no doubt, you can gulp down a Carling

and even a little plaudit for you to have a pleasant journey. But there's no warning of engineering works or of leaves on the line. Those who wish to forward plan can obtain train travel information for months in advance, although I wouldn't want to risk British Rail that far ahead.

An option gives routes that avoid London and, like the rest of Tel-Me, the results can be printed out. As an alternative to ringing British Rail itself, this makes a lot of sense. Routes, times and changes are displayed quickly and accurately.

You even get details about what kind of train it is, whether seats are bookable and, important in these days of deregulation, which shoddy privatised outfit runs the service. Only one piece of info is missing — the price.

BT Teledirectory

BT's 192 enquiry directory has improved immeasurably over the last few years: ring up 192, give an address and you invariably get the number. Against this, Tel-Me has limited superiority. But where Tel-Me improves on this is that you can type in a name and an area (if known) and the result will list all known matches, with addresses and telephone numbers.

A search for the Princess of Wales came up not with the queen of hearts herself, but five pubs in the central London area. Not bad, but even Tel-me cannot beat the ex-directory system. Okay, it's not essential, but it is useful and as comprehensive as it needs to be.

Company profilers

Tel-Me includes access to two major company profile databases. Access is not cheap, but the information provided is undoubtedly of value to anyone wanting to gen up on listed UK companies.

The Infocheck database will give you financial information on 430,000 UK companies. Information is supplied in both textual and attractive graphical formats and includes employees, turnover and share ownership.

Of particular interest to most users will be the option to get a credit opinion on any company. The graphical information is presented clearly, in full colour, and can be printed out for overhead projection — useful for presentations.

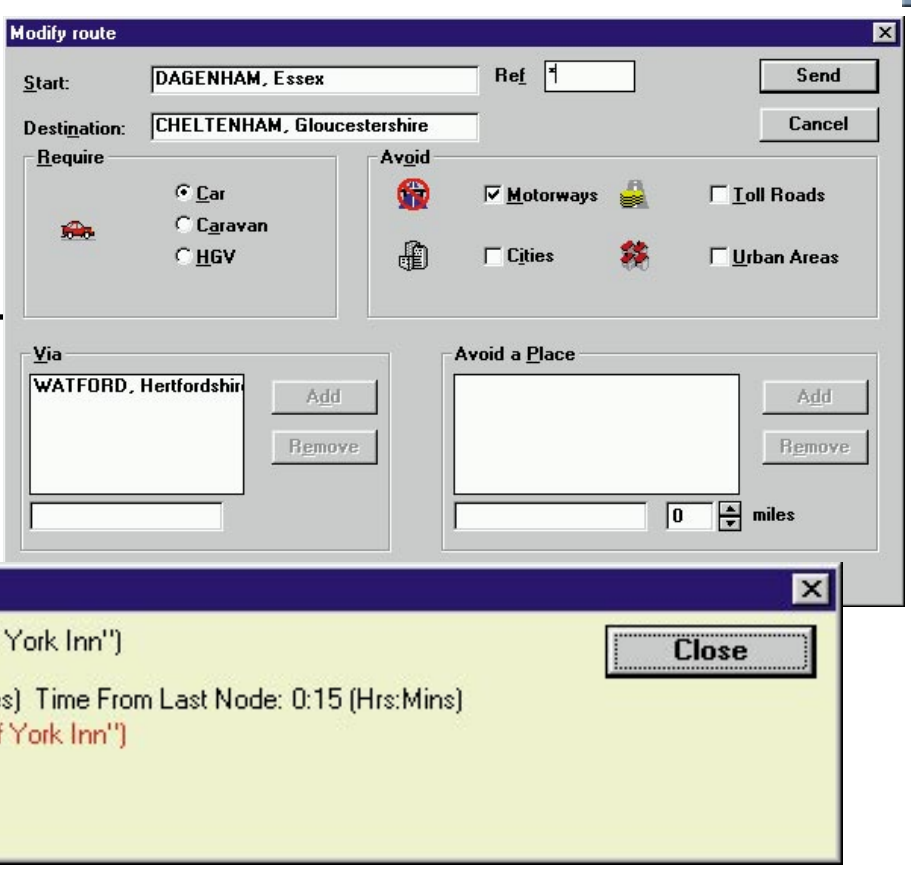
The CCN company profiler provides access to data on every UK plc, but is presented in a slightly different way, with graphs and text merged together. It is claimed to be updated daily.

Both these services are expensive if used often but would be invaluable to those who need to stay informed about their competitors as well as potential clients. Both use a two-step approach: first the company is found and then a full report can be retrieved if so desired. Highly impressive.

Thomson Business Finder

Like TeleDirectory, this was of limited but stable use. Type in the name of any business and if it's known to Thomson, Tel-me will find you the phone number, address and type of business.

As long as you know exactly who you want it works fine, but a vague input will come up with several results and if you



Right *AA Routefinder allows you to modify your route, depending on your vehicle and what you wish to avoid*

Below *Try clicking on a road or town in the Tel-Me Routefinder map and receive extra information on time and directions*

choose the wrong one, there is no going back to the full list.

AA JourneyPlanner and Travelogue

These are two excellent implementations of AA road services. The journey planner works in a similar way to a standalone mapping package. Type in where you want to go and where you want to start from, then decide whether to highlight any roadworks via AA Roadwatch. And in advanced options, specify whether you are going in a car, an HGV, a Motorhome or towing a caravan.

If you so wish you can avoid motorways, large cities and urban areas — even whole towns. So if you don't like Watford, it can easily be avoided.

Send the enquiry and Tel-Me comes back with an excellent full-colour graphical display detailing your route, or you can switch to a textual listing. Further options allow you to magnify the map to see more roads or places. This feature was truly impressive — one of the best services from Tel-Me. Clicking on any road or town brings up a dialogue box detailing that part of the route and the next major routeing point.

Related to this is the AA Travelogue database, which lists hotels, golf courses, restaurants and other leisure pursuits around the UK. Altogether this is an outstanding part of the Tel-Me package and is highly recommended.

OS Mapper

Not as much fun as the AA Travelogue or the Weather, OS Mapper is nevertheless a crisp and accurate way of finding virtually any street in the UK using OS map databases. You get displays of up to nine adjacent maps, which can be printed out in full colour and, unlike other parts of Tel-me, can be exported as .wmf files to other applications.

It was fast, it ran offline and proved to be robust in numerous searches for obscure streets. To make life more interesting, icons for British Rail, London Transport and police stations can be placed on the maps.

Cursor and zoom controls allow you to glide around the map, onscreen. A notebook attached, with a modem, and Tel-Me would prove a boon to any lost travelling salesman.

Best of British

Depending on the configuration you choose, Tel-me proves itself to be an invaluable business tool. Nothing here is superfluous. Nothing has been designed to keep you online for longer than necessary. Being British, it also understands the needs of UK business perfectly — something that most online services do not.

All the services that Tel-Me provides are designed for efficiency, and unlike more general online services or the Internet, Tel-Me makes the best of available bandwidth and delivers high-quality information. The company is technically sound — a fibre-optic network links its centre to its users — and is currently investing in future development.

Tel-Me is without doubt a consummate piece of programming and, used well, would enhance the life of any business person, either in the office or on the road. Even home users would benefit from such tools as the AA Journey Planner.

The one glaring omission is airline and train reservations. PhoneLink promises that airline booking at least will definitely appear in version 3.0.

Highly recommended.

PJ Fisher

Weather

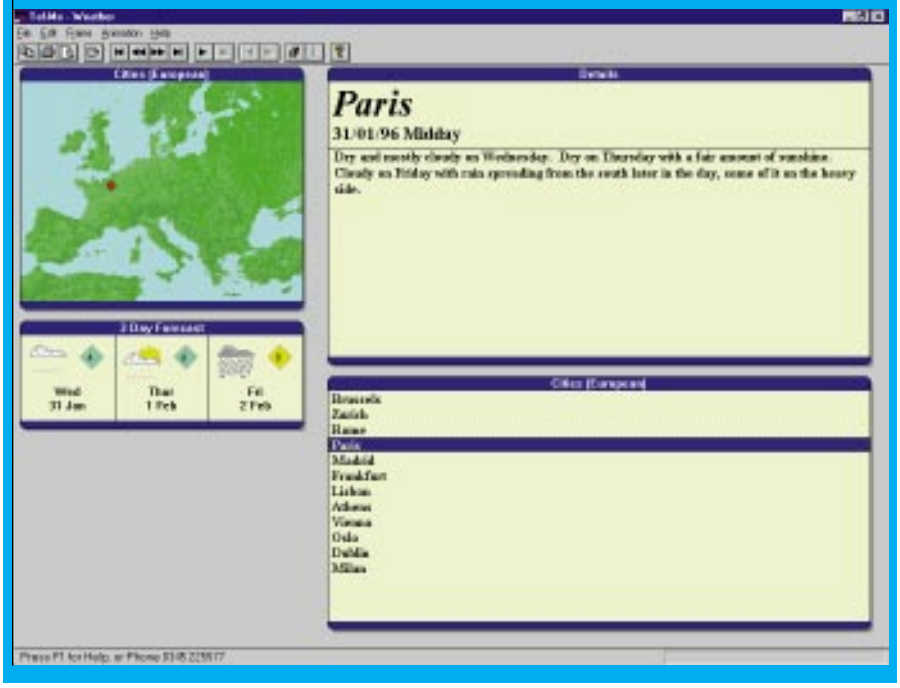
We all want to know what the weather is going to be like and Tel-Me has on board a useful way of detailing the weather, not just in the UK but also further afield into Europe. It only works for a limited number of European cities, which surprisingly doesn't include business centres like Berlin, Amsterdam or Milan.

Just like the recently launched AOL, Tel-me provides some funky animated clouds and rain, too, which make it fun, but they can can be turned off. The quality of the graphics and display is extremely high and at this level would consume a large amount of download time on most online services.

The scale of detail on the UK maps should be enough to keep any friend of Michael Fish happy. There are three-day and 30-day forecasts as well as options for displaying fronts, cloud formations and air pressure.

This is without doubt the best online weather service I have seen. Insurance adjusters will find the historical weather analysis useful too.

The weather in Paris has never looked better — at least not on an online service



PCW Details

PhoneLink 0151 6080205
One-off registration £49.95
(£99.95 including 14,400bps modem).

Monthly charge £9.95 (first month free).
All enquiries charged per enquiry.

Free services Email, UK Weather, PA news headlines (up to two hours old), News from the Liverpool Daily Post, and company name validation through CCN and Infocheck.

All other services incur varying charges, from 15p up to £24 for a full company report from the Infocheck Company Profiler.

On the CUTTING EDGE

Welcome to Cutting Edge, the section in *Personal Computer World* that combines our regular reviews of games, books and CD-ROMs with features bringing you the latest news about computing, and consumer technologies and online services.

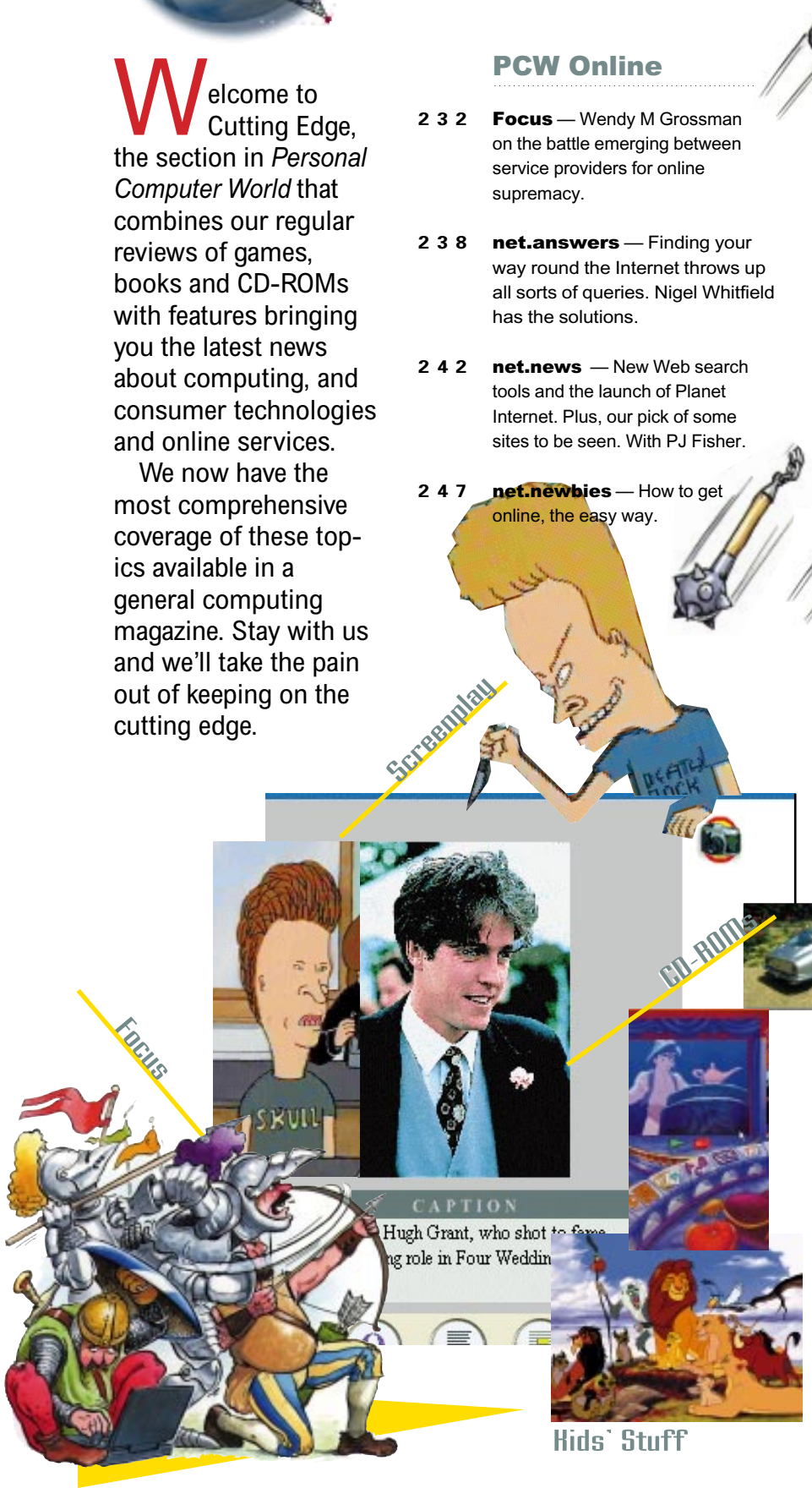
We now have the most comprehensive coverage of these topics available in a general computing magazine. Stay with us and we'll take the pain out of keeping on the cutting edge.

PCW Online

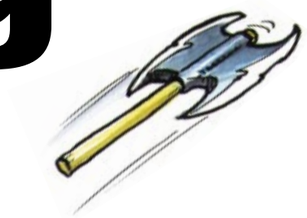
PCW Futures

PCW Media

PCW Fun



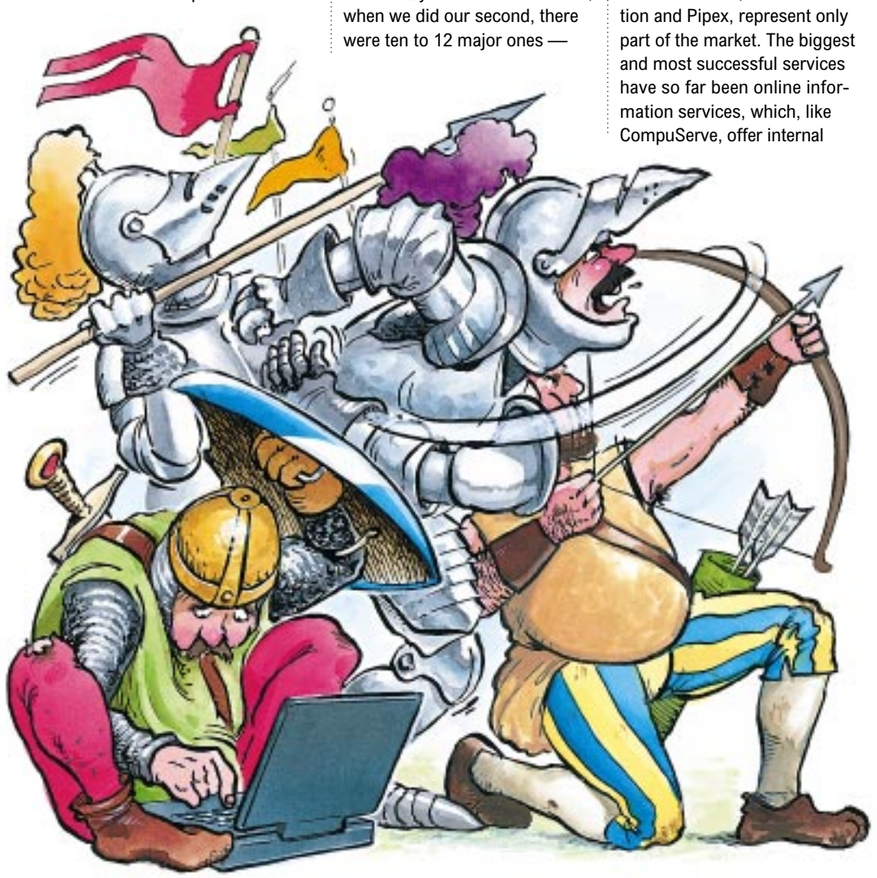
Fighting spirit



Online information services are the most successful and fastest-growing form of online business. The launch of a new generation of services, such as AOL and UK Online, threatens to give CompuServe and CIX a run for their money.

PCW Illustration by Nick *Grant*

In the summer of 1994, when *PCW* did its first round-up of Internet service providers (ISPs), there were maybe seven or eight services from which to choose. By the summer of 1995, when we did our second, there were ten to 12 major ones — and too many others to cover.



But Britain's 80-plus ISPs, such as Demon, Direct Connection and Pipex, represent only part of the market. The biggest and most successful services have so far been online information services, which, like CompuServe, offer internal conferencing and resources. Such services are typically more expensive than those of direct ISPs. Nonetheless, they have more users. Demon, probably the largest of the flat-rate ISPs, claims some 45,000 members.

CompuServe's UK membership boasts 230,000 and a growth rate of 7,000 to 10,000 per week. Even if half of those members drop out within a year, CompuServe is adding a Demon-sized group of members every few months. Whatever type of service people choose, however, the "killer app" for online services is always the same: electronic mail. It accounts for about 70 percent of online usage.

CompuServe has almost had the UK online services market to itself since it officially started up in the UK in 1990. Until UK Online launched in August 1995, with a mix of local conferencing and family-orientated Internet services, CompuServe's only professional competition for UK local chatter was the Surbiton-based conferencing system, CIX. Founded in 1987, CIX is the oldest electronic conferencing system in Europe. It began offering direct IP access to its 16,500 users, and anyone else who was interested, in the summer of 1995 (it's had Internet and Usenet gateways for a couple of years).

CompuServe has many new competitors. First on the list is America Online, re-christened AOL for European consumption. It is a classic business turnaround story in the US, where it came from a long way behind CompuServe, the market leader at the time, to take over the number-one domestic spot in 1995.

Head start

Overall, AOL has only slightly more members than CompuServe, but if you subtract the rest of the world and just look at the US — the only place AOL has operated until now — AOL is way ahead. Jonathan Bulkeley, the (American) managing director of AOL's UK service, believes the company can repeat its success here.

"For the general consumer we're a better service," says Bulkeley, who admits that he himself uses and "enjoys" CompuServe as well as his own system. At the same time, he points out areas of uncertainty that make the UK a much different arena than the US.

"Computer penetration is a question mark," he says. "Local telephone calls are a question mark." In most areas in the US, local telephone calls are charged at a flat monthly rate, no matter how many the customer makes or how long they last. An average US AOL user, he says, spends seven hours a month on the service. He knows it will be less in the UK, where the phone bills add up, as they also do for Americans who live in rural areas and must access the service via long distance. But AOL is starting in the UK with 28,800bps access throughout its many PoPs (Points of Presence); CompuServe is now scrambling to upgrade its network to those levels.

The Beta version of AOL on show in mid-January was verging on being cute. For the weather, for example, you get a map of the (green) UK with little bouncing clouds and falling rain. Users are welcomed to the service by Joanna Lumley's voice. And, in a clear case of overkill, email is rechristened "post".

Newcomers to AOL always find the amount of time spent downloading artwork frustrating. There is no way around this: you can't turn off the graphics, as you can on CompuServe or the Web. Once you've been on the service for a while and have visited most areas, this problem diminishes. Bulkeley says AOL is planning a CD-ROM version with all the current artwork on it, and the next version of the client software is expected to have progressive rendering.

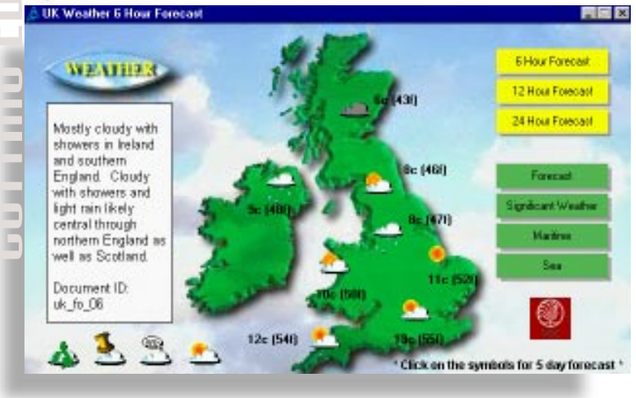
Bad company

On the Net, AOL is famous as the service whose users everyone despises (a particularly cruel jibe is that AOL really stands for Arseholes OnLine). When AOL first opened its Usenet gateway, its members managed to make bigger bozos of themselves than almost anyone else on the Net; these days there are complaints about its built-in Web browser. One reason occasionally mooted for some AOLers' clueless behaviour is the many thousands of free disks AOL distributes every month in the mail and on the covers of magazines, each bearing a month's free trial of the service.

Martin Turner, the (British) general manager of CompuServe UK, believes that none of this will give AOL a lead over CompuServe. "I don't think helicopters dropping diskettes is going to be the key route to success here in the UK," he says. CompuServe's 230,000-member community, he believes, reflects the company's heavy investment in partnerships and local products.

CompuServe is the oldest of the "big four" online services. Its interface is beginning to show its age

CUTTING EDGE



AOL has worked hard to make its interface eye-catching. The weather map features animated clouds and rain — just like TV!

AOL gives parents the option to prevent chilren accessing particular newsgroups

"One lesson we learned very painfully when we came over here is that you cannot transfer lock, stock, and barrel to the UK. We're still regarded as being very American. If they think CompuServe is American, where is AOL coming from?" He believes both AOL and the Microsoft Network (MSN) are suffering from the same problem — an attractive interface, but a lack of UK content behind it: "Smoke and mirrors."

MSN, he thinks, is at an even bigger disadvantage in the market, as "Microsoft is always thinking of trying to sell other Microsoft products," he says. "That is why I think CompuServe and other online services that specialise in this area are going to be more successful. It is our business, and it is what we live for."

Turner — who once worked for BT — believes, like many others in the industry, that there really isn't room in the market for more than two or three major players. Besides CompuServe and AOL, UK consumers are being asked to find room in their online hearts for Europe Online UK, MSN, Delphi, and UK Online. Unlike CIX, all of these services are backed by big players. Europe Online's investors are AT&T, publishing giant Pearson (owner of the Financial Times and the specialist online newspaper database FT Profile) and German publisher Burda, as well as a host of smaller Luxembourg and Swiss backers. UK Online is backed by Olivetti Telemedia, Delphi was bought up by Rupert Murdoch's News International in 1994, and MSN has all of Microsoft to call upon.

All services are having to grapple with the sudden popularity of the Internet. Apple recently announced that its eWorld service will be converted into a glorified Web site, accessible to everyone. Delphi, too, announced in the Autumn of 1995 that through a deal with MCI the 125,000-member service will get a complete new interface; just when isn't clear. But the service has shown how difficult it can be to achieve any sort of critical mass on a new service; a year after its launch, its UK forums still get few messages.

UK okay?

UK Online is hard to judge. It opened its doors to subscribers on 1st September 1995, and when people speak, as they do, of the industry not having room for many major players, they seem to write off UK Online as being one. Nonetheless, the service has ideas. One is for a hardware solution that would allow consumers to buy a cheap access terminal along the lines of BSkyB or Vodafone's business models.

"We're getting ready to revamp the editorial on UK Online," says Jennifer Perry, the service's sales and marketing manager. Perry says the service has recognised that it needs to find better ways of using the new medium. Accordingly, the plan is to incorporate some broadcasting-style elements, such as live hosts like DJs, to encourage chat.

Also discounted by some observers is Europe Online, despite its high-powered backing. The company itself believes its biggest selling point is in being thoroughly native. "It's the first service for Europeans designed by Europeans," says Chris Caswell, the service's marketing director. "It will be the most focused and the most relevant to anybody."

Family affair

Caswell says the service expects to have a broader scope than UK Online, although the first and most important of the three types of target customers he names is the same as UK Online's target market: family members. Beyond that, the service is aimed at small office/home office (SoHo) workers and "Dinkies", those creatures you read about in the newspapers who have double income, no kids, and the kind of jet-setting lifestyle that makes them want to book plane tickets at 2am in between looking up the sports results and checking their email.

But family is the most important, and Caswell says he defines success as getting a number of young mothers taking Berlitz language classes through the service at a time convenient to them. That kind of use, he believes is "where the benefit will be."

As late as mid-January, however, many people believed that Europe Online wouldn't make its target first-quarter launch date. For one thing, the service changed direction late in the development stage from its intended platform, AT&T's Interchange, to NetScape 2. Caswell says simply that the company was waiting until it had content providers to make any noise about its plans. Already lined up are: Reuters and UK News for news services, British catalogue specialist Great Universal Stores for interactive shopping, AA Road Watch, and three titles from Future Publishing (owned by Pearson). No matter what the competition, Caswell says the company plans to have 35 percent of the market by the year 2000.

MSN — about turn

The biggest question mark, however, hangs over MSN which claims to have signed up

Services overview

AOL: A colourful world of shopping, online chat and information services including daily news feeds from a variety of sources, as well as the commercial news wires and a mass of publications such as the *New York Times*. It's too soon to tell how the service will fare in Britain, but UK-specific services ready for the launch include online shopping. Cost: £5.95 for ten hours per month, plus £1.85 per additional hour.

CIX: Entirely UK-based conferencing. A somewhat techie audience but a fast and efficient interface with a good offline reader that gives quick and streamlined access to Usenet. CIX's unique selling point is that anyone can start a public or restricted-access conference at any time. Cost: £3.60 per hour peak; £2.40 per hour off-peak.

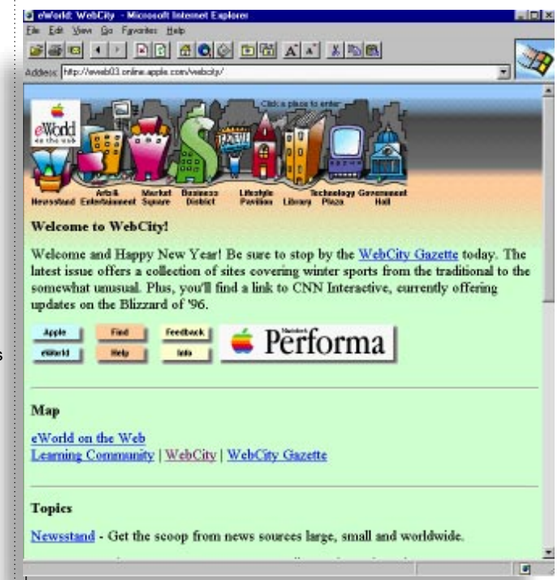
CompuServe: The broadest range of information services in the business. UK-specific products include very lively British forums, technical support, shopping, AA Roadwatch, airline guides and reservations. There are global stock quotes, a full set of commercial newswires, film reviews, periodical databases, full Internet access, online shopping, and more. It has announced plans for home banking, too. The service is gradually dumping its ASCII interface so users should expect to have to use the system's own navigator software. Cost: $9.95 for five hours per month; some services are surcharged. A low-cost, Internet-only service is also offered.

Delphi: Primarily a conferencing system, Delphi also offers online airlines guide, weather, and the AP newswire. But the service has failed to achieve any kind of critical mass in the UK. Everyone seems to be waiting for Delphi's new, Web-based interface. In the meantime, check out the service's Web site at http://www.delphi.co.uk, and follow the links to the *Times*' new Web site. Cost: £20 for 20 hours per month (additional hours £1.80) or £10 for four hours per month (additional hours £4).

Europe Online: By Europeans, for Europeans, using a very slow Web-based interface. Plans are to use London-based journalists to create UK-specific content such as round-ups of London health clubs or cheap holidays and intermingle these with links to Web sites and other Internet resources as appropriate. Services announced are AA Roadwatch, Reuters, UK News, Great Universal Stores catalogue shopping, and several titles from Future Publishing. Pricing and launch date are yet to be advised.

Microsoft Network: UK content is almost non-existent; if it's there, the service is so desperately slow to load anything that you cannot find it. US content includes an exclusive deal with US TV network, NBC, to provide a joint online news service. It is also planned to integrate the service with Microsoft products like Encarta and Cinemania, and with users' desktops. You must have Windows 95 to use the service. Pricing is due to change this month, when the service converts to Internet protocols.

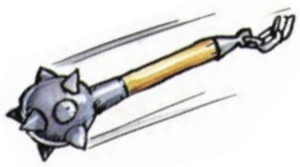
UK Online: Web-based conferencing. Information services are still thin on the ground — the service is rethinking what it's going to offer. Aimed specifically at the family market, the service cuts off access to Internet material that may be generally considered undesirable for children. Cost: £14.99 per month including VAT, with up to four mailboxes per account.



eWorld was a failure to the extent that it is now accessible directly on the Web…

…will MSN suffer the same fate? It deserves praise for its design at least

CUTTING EDGE



600,000 users in the US in the months since 24th August 1995 (Windows 95 day). In the UK, the service has disappointed; it's expensive (twice the US price) and extremely slow to load anything, even its opening menu (four minutes, at 14,400bps). In addition, you have to move to Windows 95 to use it at all.

MSN has also had a sudden change of direction. The service was designed for, and until the end of March will run on, an X.25 network. It is moving to an IP network that will allow it to reduce prices and improve performance.

Gary Hunt, the product manager for MSN, says the next version of the software client will cache those dismally slow graphics, and as users drag services onto their Windows 95 desktops MSN will integrate itself seamlessly into their working environments. The March re-launch will also add seamless Web access, much the way CompuServe and AOL have done already.

Hunt says the service is aimed at consumers and first-time users and is specifically designed to make the Internet easy to use. He believes the advent of MSN has improved the situation for consumers, by pushing CompuServe and AOL into more competitive pricing schemes.

"On MSN we want to provide really high-quality value-added information," says Hunt. "Those services will be the ones that succeed." MSN will, he says, benefit from unique deals such as the one it has recently signed with the American TV network, NBC. Equally important, he says, is creating a community that will keep people logging on: "It's one of the keys to any online service."

Most would agree with him on that last point, from CompuServe to CIX and UK Online. Everyone agrees, too, that the UK market is not big enough for more than two or three major players, although most believe that the online world will have room for smaller, niche services that target specific markets such as financial services or sports.

Online information services *vs* ISPs: reasons to be cheerful

Software: online services' proprietary software makes setup easier, but means having to allocate 5Mb to 10Mb of disk space per service.
Cost: online services tend to be more expensive.
Speed: online services' internal organisation and search facilities tend to make finding things much faster.
Technical support: the bigger the service, the more resources it has for helping customers and for designing easier-to-use software.
Online help.
Local community feel.
Built-in mechanisms on some services: (AOL and UK Online especially) that parents can use to block kids' access to certain types of material.
Security for online shopping within the service's firewalls.
Added email features: such as receipts (CompuServe, CIX), easy uudecoding (CIX), and near-future facilities such as email direct to pagers (CompuServe, AOL) and telephone text-to-speech access (CompuServe).
System reliability: generally better on the larger, proprietary systems.
Higher signal-to-noise ratio than "free" services like Usenet: the cost of admission means less wastage of online time.

Where they disagree, as you might expect, is about which services will survive. And it's not just each other they're competing with. As AOL's Bulkeley puts it: "Really, we're competing for people's time. The challenge is, when people come home, to get them to turn it on and keep it on."

Wendy M Grossman

● *Jennifer Perry has since left UK Online.*

PCW Contacts

AOL 0800 2791234
CIX 0181 296 9666 (voice); 0181 296 1255 (modem; you can sign up online)
CompuServe 0800 289378 (voice)
Delphi 0171 757 7080
Europe Online 0800 106610 (voice); http://www.europeonline.com (you can sign up online)
Microsoft Network 0345 002000
UK Online 01749 333333

CUTTING EDGE

net.answers

Nigel Whitfield guides you through the Internet.

Locked into Bitnet?

Q. *"The only access I have to the outside world is via Bitnet. Can you advise me whether it is possible to communicate and download medical files from the Internet?"*

A. Yes, you can access much of the information on the Internet, via email. For instance, you can retrieve files using an ftpmail server, as email can be sent between Bitnet and the Internet without any difficulty — though exactly *how* it is done will depend on how your computer system is set up, so we can't give concrete instructions.

Although this will work fine for most text-based email, there is one big issue of which you need to be aware when requesting files via email: Bitnet computers don't all use the same ASCII standards as most of the Internet. Although this doesn't affect most messages (as they are automatically converted) there are some characters, such as the tilde (~), which are simply lost when a message passes through some gateways.

For an ordinary piece of email this probably doesn't matter, but if you've requested a file and it's being sent using uuencoding, there is a chance that it will be corrupted when it crosses the boundary between the networks. You should always use an alternative form of encoding that is designed to avoid this problem.

You'll need a program on your PC to convert the files that you receive; XferPro, which we discussed in the February issue, will do the job for Base64 (or MIME) encoding. Some older ftpmail systems use "btoa" encoding instead, so you may need an encoder which will understand that. For instance, ESS-Code is available in the file ecd67win.zip, from the packages/simtel-win3/encode directory on src.doc.ic.ac.uk.

To use an ftpmail server, begin by sending it a message containing the command "help". If you want to retrieve messages, the commands that you put in your mail are the same ones you'd use if you were using the ftp program directly.

For example:

```
open ftp.demon.co.uk
cd pub/simtel/win3
dir
quit
```

will retrieve a directory listing from Demon Internet's FTP server.

Instead of using an Internet ftpmail server, there is a system called BitFTP which can be used from Bitnet to access Internet sites. It can send files in a variety of formats, including uuencoding (which doesn't create problems in this case, as the message starts off within Bitnet), or Netdata.

The commands understood by BitFTP are similar to those used by ftpmail, but the first command should be "ftp" rather than "open". Again, a message containing the command "help" will send you full instructions. From within Bitnet, send your commands via email to the address BITFTP@PUCC.

Sharing with a friend

Q. *"Is there any way that I can link to a friend's computer via the Internet and share files?"*

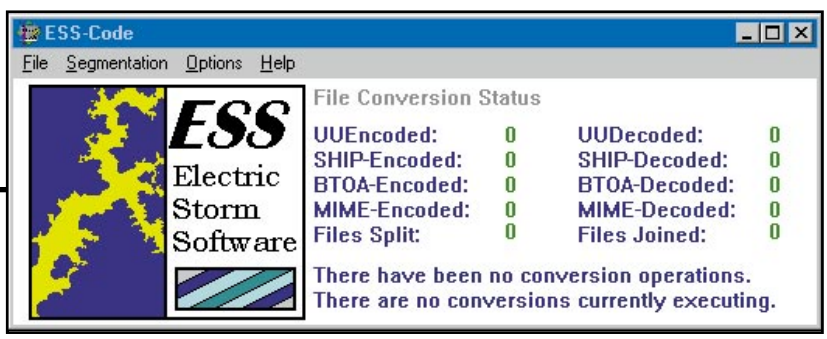
A. Yes. In fact, there are quite a few different ways. However, there are some important things to bear in mind.

The first thing is that many Internet service providers don't allocate you the same address each time you dial up — although your email address never changes, the actual numeric address of your computer will be different.

Some providers do offer a "static" address and, ideally, at least one of you will need one. If you both have "dynamic" addresses, then you'll have to check the information returned by your Winsock to see what address you've been allocated; this is often displayed as part of the login sequence. Then you'll need to tell your friend the address. But; if you only have the one phone line…

So as you can see, it's not very easy unless one or both of you has a static Internet address. Without that, your computer won't be able to connect to your friend's.

Assuming you can overcome that hurdle, the next thing is how do you share files? The safest way is by using an FTP program, and by making sure that only certain parts of your hard disk are available with a password.



ESS-Code can decode files in the btoa format used by some ftpmail servers

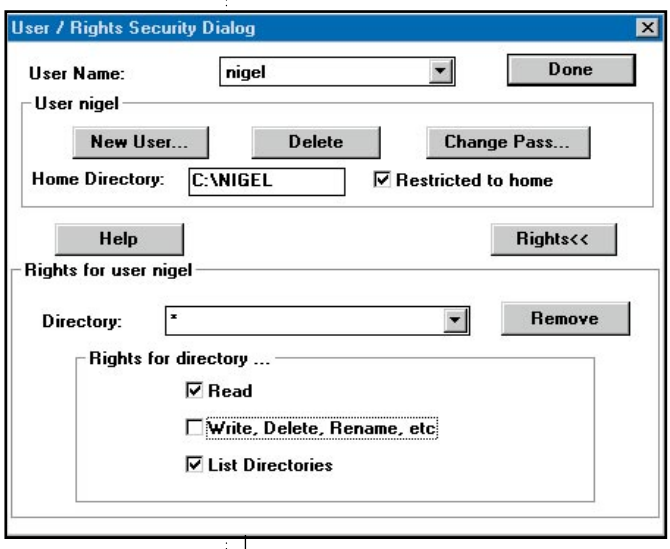
There are several public domain and shareware FTP servers around, including wftpd, which is available from the pub/ibmpc/win3/winsock/apps/wftpd directory on ftp.demon.co.uk. By running this program on a PC with a known Internet address, you'll be able to connect to it from elsewhere on the Net and restrict access to different parts of your hard drive according to the username and password that people specify when they connect.

It's also possible to use the Windows file manager, effectively extending a Windows for Workgroups network over the Internet. To do this, you'll have to make sure that TCP/IP is installed in your Network setup, which isn't always easy to do with shareware Winsock programs. With Windows 95, you can use the Network control panel to enable Microsoft Networking over TCP/IP, and make sure that it's linked to the Dial-Up Networking.

The best advice, however, is to not even consider doing this. Although it is possible and may be much easier than using FTP, as Windows 95 will warn you, it is also not very secure and it's tricky to set up.

Another alternative is to use a program like Chameleon NFS, which will have to run on both PCs and allows you to use the standard NFS protocol to share your disks. Again, this isn't very secure, and since you'll have to buy extra software it's not really recommended.

A final alternative would be to use a remote control package to link the two computers via the Net: ReachOut Remote Control, from Stac, can be used over the Internet and allows you to attach to drives on another system as well as providing plenty of other features, but you'll have to fork out a lot of money. Unless you really do want completely transparent file sharing or the extra facilities of remote control, use FTP instead.



It's safer and easier to share information using FTP than to use Windows for Workgroups over the Internet

The art of chatting

Q. "I would like to make use of the facility to chat online over the Internet. There is an icon, by the name of WinChat, which I am unable to use. I would appreciate it if you could tell me whether this is the correct application for chatting on the Net and whether there are any other ways of chatting online?"

A. There are quite a few ways of chatting over the Internet, depending on whether or not you want to talk to one person, or to a group of people. WinChat is an application that is designed to talk to someone else who has the same program — there's no equivalent, for example, on a Unix system.

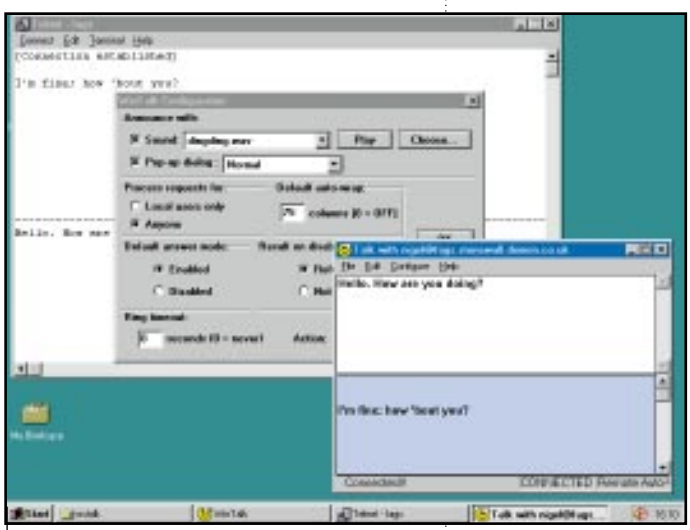
The traditional one-to-one program for chatting is called "talk" on Unix systems (or sometimes "ntalk" and "otalk", which denote different versions). There's a compatible Windows program, as well, called WinTalk which you download from ftp.demon.co.uk; this is called wtalk121.zip and can be discovered in the pub/ibmpc/win3/winsock/apps/wintalk directory.

For chatting with more than one person at a time, you should try Internet Relay Chat (IRC), which relies on a network of servers around the world to carry discussions between different people. The discussions are divided into different "channels", covering areas as diverse as general UK chat, NetWare support, dating, and firearms — whatever you want to chat about, you'll probably be able to find a channel somewhere on IRC.

In addition, IRC allows you to send a file directly from your computer to someone else's so, for instance, you can exchange pictures while you type messages to each

other. To connect up, you will need an IRC client — they are available for most types of computer.

For Windows, look on ftp.demon.co.uk in /pub/ibmpc/win3/winsock/apps/irciiwin or wsirc. Macintosh users should try looking in /pub/mac/internet/irc.



WinTalk is one way of chatting to another person, but if you want to talk to a whole group you should try Internet Relay Chat

Making the right connection

Q. "I'm considering connecting my computer to the Internet. Will an ISDN connection really be much faster than a modem?"

A. It depends on what you use the connection for and on which facilities are supported by the particular provider you may choose.

Many service providers don't offer data compression on their ISDN connections, so the speed at which information arrives will be more or less constant, whether it's text like Web pages and email, or pre-compressed data like ZIP files or JPEG images, with a maximum speed of 64,000 bits per second (bps).

With a V.34 modem the basic transfer rate is 28,800bps, and when you transfer a

Credit card caution

Q. *"If I buy something via the Internet, will my credit card details be safe?"*

A. Like most questions about the Internet, there is no hard and fast answer to this. As a general rule, you shouldn't send your credit card details over the Net unless you're sure that the system to which they're going is secure.

For example, the NetScape browser and server software includes features designed to transfer such information safely over the Net — although earlier versions were cracked last year. Some other Web servers and browsers don't use any encryption, but more are adding it all the time.

Remember to keep a sense of perspective, though: even though it is possible to intercept information travelling across the Internet, it's not very easy and probably a lot more trouble than it's worth at the moment since the amount of commercial information, like your credit card details, is very small compared with all the rest of the data.

As a rule of thumb, only enter your details on a Web page if you know that it's running on a secure site; many will tell you when that is the case. Don't put credit card information in an ordinary email message; email can bounce, or may be wrongly delivered, and it may be held on strange machines during its journey across the Internet, whereas that's not the case with a Web page.

Equally as important as the technical security considerations, is what you know about the person from whom you're buying — especially if they're overseas and beyond the reach of British law. Remember, when you send all your card details to someone, they can then charge items to your card; so if there is a problem, you'll have to query it later with your bank or credit card company.

In fact, considering the technical work involved in intercepting your information as it travels across the Net, it's currently more likely that any problems, rather than emanating from a hacker, would arise from dealing with an unscrupulous vendor. So, *caveat emptor*.

compressed file you'll probably see a typical rate of around 30,000bps. For text, you can easily achieve rates of more than 50,000bps and even higher for some other types of information like uncompressed bitmaps — very close to the speeds offered by ISDN.

This may suggest to you that there's no need for ISDN (especially when you consider BT's extortionate pricing) but in fact there are other reasons to consider it. Firstly, it's quite possible to use data compression on an ISDN link, although not much equipment is available at the moment. In the future you may find more service providers willing to offer it — at a price.

Secondly, ISDN allows you to connect more quickly than with a modem. Modem links can take more than 30 seconds, but a digital link removes the need for the modem negotiation, and can typically take less than ten percent of the time required by a modem.

Practically, this means that a system connected via ISDN can be set up to respond almost in the same way as one that's permanently on the Internet, with only a short delay before connections. For the home user who simply wants more speed, it's probably not worth considering until the installation charge is reduced, but for an office that wants to dip its toe into the Internet without the expense of a leased line, then it's a far more attractive option.

Serving it up

Q. "I am managing a Novell Network server and I can reserve another computer for Linux/Unix OS; but what then? We are going to have a "leased line" connection from a provider and a router to connect to the PC. I'll be installing Linux.

Having found copies of ftp, gopher, telnet, news, finger, ping, archie, www and chat applications for Windows for WorkGroups 3.11, what do I have to do on the server side?"

A. How many answers would you like? There are literally dozens of different ways to set up an Internet server on your network, and they'll all differ slightly depending on the type of server you're using.

Most of the servers that you'll want (like ftp, Web and mail servers) can be downloaded from sites all over the Internet. For Linux, you'll probably find much of what you want on sunsite.unc.edu. Although it's tempting to just download the first version of each program you find — don't!

Internet server software changes all the time, and you should read the relevant newsgroups, or join mailing lists, and make sure that you're fully aware of all the security issues concerning the software you want to run.

For instance, some sites may have ready-to-run copies of Web servers for you to download, but if you're not careful you may end up with a version of the NCSA server that makes it easy for people to break into your system.

It is impossible to provide a full answer within the space available here. Anyone who wants to set up a server could do worse than to invest in a copy of *Managing Internet Information Services*, which is published by O'Reilly & Associates.

Name change conundrum

Q *"I'm trying to send files to someone as attachments, using Eudora on a PC, but when they reach the recipient, they're always saved with strange names. How can I solve this problem?"*

A It sounds like you're using Eudora 1.4 which is an older, free, version of the program. Although Eudora can decode files that are sent as MIME attachments, it doesn't look at the name of the file when it's decoded but instead creates a filename based on the subject of the message.

So, if you're sending more than one file it's simplest to create a new message for each file, with the subject providing the file name: if you attach all the files to one message and make the subject the name of the first file, then the other files will all have similar names. You should also tell the person you're mailing to turn off the automatic saving of attachments so that they can choose where they want each file to be placed on their hard disk.

PCW Contacts

Nigel Whitfield is a freelance writer and maintainer of several Internet mailing lists. He welcomes comments via the address **nigel@stonewall.demon.co.uk**.
If you have questions you'd like answered, please send them to **net.answers@stonewall.demon.co.uk.**
Please note that a personal response to every query cannot be guaranteed.

net.news

PJ Fisher blows the electronic bugle.

Massive Net growth forecast

Wannabe Web developers had better get their skates on. A report published by Durlacher Multimedia and Intervid forecasts that the business of creating Web pages will jump from a £3m industry in 1995 to more than £30m in 1996.

The UK Internet market as a whole will grow from £35m to more than £900m by the year 2000. However, the report also reveals that the Internet still appeals to a minority and a particular one at that. Less than 300,000 UK PC users connect to a bulletin board or have an account with an ISP and the most popular online subject is sex. Most users tend to be 25-34 year-old middle-class males.

The first wave of Internet profits will come from ISPs, software applications provision, consultancy and hardware provision. It is only in the second wave that profits will come from content providers, according to the report.

Bad news for start-ups is that BT and Microsoft are expected to share at least 25 percent of the UK Internet market. Advertising on the Internet will be worth $200m this year and rise to $1bn by the end of the decade.

Another survey by International Data Corp (IDC) predicts that total business volume on the Internet worldwide will rise to $1 trillion by 2010.

Durlacher Multimedia 0171 628 4306

Spider seeks Web

Digital is conducting trials on a new technology which, it claims, is the most advanced search and indexing technology on the Web. In its final form, Super Spider is expected to search the entire text of the Web and runs on the company's 64-bit Alpha computers.

Digital claims that the search engine has been crawling the Web at up to 2.5m pages per day since it began last December. It says that users will be able to pinpoint links to their own pages from others on the Web.

The software creates a "brood of spiders" that searches the Web while scaleable software locates and indexes the text it finds. The search engine, found on the Alta Vista Web site, offers options for case-sensitive keyword searches, as well as restricting searches to titles or other parts of documents.

Digital says that a combination of 64-bit servers and fibre-optic networking make its search engine faster than any rival.

http://www.altavista.digital.com

Planet yuppy

AOL, Europe Online, UK OnLine, MSN… it seems like everybody wants a slice of the online action in the UK. And they have been joined in the fray by Dutch-owned Planet Internet.

From its base in London, Planet Internet is seeking to differentiate itself by wrapping its software in designer packaging and colour-coded floppy disks. The disks contain NetManage's Barracuda software as a front-end to the Internet.

KPN, the Dutch telecoms company behind Planet, is deadly serious about the UK. It is investing £10m in the venture, and plans to follow up with further multimedia enterprises.

Planet promises full customer service with over 1,000 modems at the London HQ, and Silicon Graphics server technology. A full London service should be onstream by early spring with a full UK roll-out following later in the year.

A spokesman for Planet said it was targeting young, affluent ("around 30, about to buy their first BMW"), males in the UK and will back this up with a poster campaign near football grounds and city centres.

Planet Internet 0171 345 4000

http://www.uk.pi.net

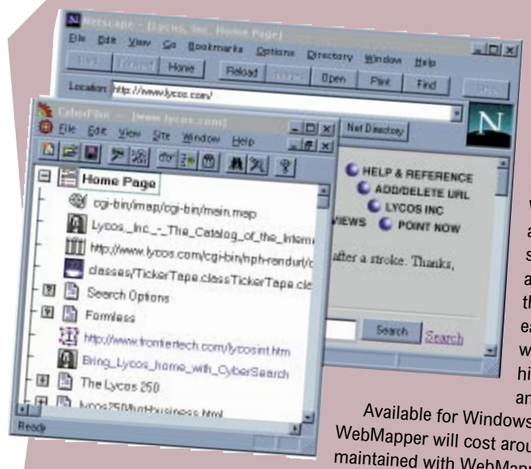
Oracle claims its Internet PC will ship in March

The original black box and much talked about Oracle Internet PC will arrive this month, according to the company.

The mini device will cost around $500, complete with cabling and plugs for TVs or PCs. It will not include a built-in monitor, as previously expected.

A public launch is expected to follow shortly in the US.

Get NetCarta!



★NetCarta's new WebMapper is aimed at Web site managers who need to keep control of ever-growing sites. WebMapper displays all objects held on the site including graphics and audio files, and their relationship to each other. The software is designed to highlight broken links and "phantom pages".

Available for Windows 95 and NT, WebMapper will cost around $499. Sites maintained with WebMapper can publish their WebMaps to browsers. A visual table of contents displays the hierarchy of pages and files contained on that site. Double clicking on any item will open it in the Web browser. The map shows the whole site in a visual format similar to the Win95 Explorer.

Based on similar mapping technology is CyberPilot; designed to make it easier for Web users to search a complex Web site. No price has been fixed for CyberPilot, but an evaluation release is available on NetCarta's Web site.

http://www.netcarta.com

BT Watch

All BT rumours and dirt gratefully received. It's good to talk.

Not wishing to waste any time, BT's thrusting new chief executive Sir Peter Bonfield (ex-ICL) is busy digging the trenches for an all-out war with Oftel, the phone industry regulator. Faced with new competition (AT&T, cable, ISPs etc) and possible Oftel price controls on its own services, Bonfield has promised a "rollercoaster ride" for BT's shareholders as it fights what it sees as an aggressive and biased Oftel. In BT's eyes, the regulator wants to slash the company's profits and make life easy for new competitors.

There is even talk of BT being broken up (in the same way as AT&T in the US) to end its dominance. So worried is BT that it is alleged to be lobbying its shareholders and City institutions against Oftel's proposals. BT denies the claim.

The danger is that the battle seems to be based on personal differences between Bonfield and Don Cruickshank, the head of Oftel. Rational debate as to what might actually be best for BT and its UK customers seems to have been put on hold.

But BT boldly continues to prepare for the future. It has been instrumental in plans to establish the UK's first televersity *(sic)*. Based in Suffolk, it will use the Internet and video-conferencing as its primary teaching channels. The exciting buzzword, televersity, has been coined to describe a university that will "exploit the advantages of technology and the information superhighway" — Suffolk has no university at present.

"This promises to be a 'world exemplar or shop window' of televersity techniques. If the Open University were starting today, this is how it would be done," said BT.

BT

pf_fisher@pcw.ccmail.compuserve.com

Carry On Banning

The recent controversy over CompuServe's acquiescence to German authorities, by banning access to certain newsgroups, shows no sign of abating. CompuServe says it will return access to the banned newsgroups, except in Germany, but alternative sources suggest otherwise. The online market leader is now developing technology which will allow it to regulate material on a country-by-country basis.

CompuServe claims that pressure was mounted by the German government for a ban on the allegedly sexually explicit newsgroups. But groups fighting censorship of the Internet in any form fear that this is the first sign of an international clampdown. If the German government can achieve such instant results, others may soon follow. The ban has had no effect on the newsgroups themselves, which continue unregulated and accessible as normal through other ISPs.

Milky way

Milktruck is a new application aimed at Web users who tend to visit the same Web sites on a regular basis.

Based around cached bookmarks, Milktruck is designed to deliver only the content that has changed since the last visit. This saves time and online charges, says the company, based in Sunnyvale, California.

To set up Milktruck, users install client software and set it to work with a Web browser along with a list of Web sites to be checked by Milktruck.

It then launches your browser off-line for you to look at the Web sites now cached. Any updating required will be carried out by going online, grabbing only new information and adding it to the cached Web site. This new information can then be browsed off-line.

The company hopes that Web sites will begin to offer automatic support for Milktruck so that the client side works in the background and automatically updates sites when online.

Milktruck will support the following browsers: Wollongong Emissary, Microsoft Internet Explorer, NCSA Mosaic, NetScape and Quarterdeck Mosaic.

Those connecting to the Web via online services that support Winsock, such as CompuServe, will also be able to use Milktruck.

A beta version of Milktruck is available on the company's site at http://www.milktruck.com.

Armchair Internet

At the Consumer Electronics Show held in Las Vegas, Compaq, Acer and Packard Bell each expressed interest in producing cheap "black box" network devices, such as those proposed by Oracle's Larry Ellison.

Philips, too, is about to release a device that will allow Internet access through domestic TVs.

Similarly, ViewCall America is expected to release a $300 box that attaches to the TV for full access to World Wide Web pages.

Philips is also developing a $400 phone that will connect to the World Wide Web through an online service and reformat data on a small, possibly LCD-based screen.

Philips believes that PCs will never achieve the same level of acceptance in the home currently enjoyed by television sets and phones, and so it is looking to market domestic-friendly devices.

In the summer, Apple will finally release its Pippin hardware which doubles as a CD-based games player and an Internet device using NetScape software.

Other Internet gadgets to look forward to are the new "screen" telephones, which have keyboards to allow users to send paging messages and email.

Net Opinion

Is Apple going soft at the core?

Apple certainly has its problems at the moment, and rumours of its impending demise are undoubtedly exaggerated. But the company seems to be doing itself no favours.

Just when it needs to boost its stock (literally) an announcement by MacWorld, in San Francisco, on how it plans to counter the Microsoft Internet offensive would have been ideal.

Instead, there were the usual smug statements about how inferior Windows 95 is when compared to Mac OS — it is, but buyers don't care — and the depressing news that Copland, the multitasking successor to System 7.5, will not now be released until 1997.

The only inkling of Internet integration, of the type Bill Gates talked about, was a technology called CyberDog which will be a part of Copland.

Apple has been as remiss about the Internet as Microsoft but the difference is that Microsoft is doing something about it right now.

By early 1997, when Copland is released, it will undoubtedly be advanced but Windows 95 will have another year's development behind it.

CyberDog is said to be an intelligent Internet browser that not only searches for specific subjects, but learns the user's specific interests. After a while it starts to look for such data automatically.

It will be integrated into the Mac OS, which sounds great, but why isn't it here now? After all, Microsoft is working on something very similar,

If Apple is to beat Microsoft and others, even those it sees as its friends (NetScape, Sun), the company has got to start pushing world-beating technology out of the door. This applies particularly to the Internet area where everybody is looking for tools that will make the superhighway productive.

Instead of Apple telling the whole world that the Mac is a "plug and surf" platform, it should instead be stealing Bill Gates's phrase and becoming "hardcore" about the Internet — in fact, right to its very core.

Interactive Apple servers made easy

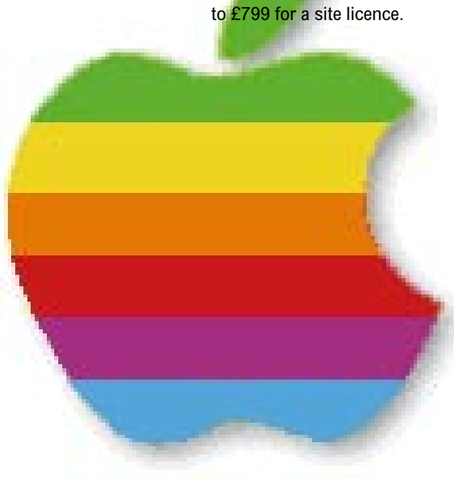
Web authors using Apple servers could benefit from using a couple of tools, newly available, which are claimed to make it easier to design dynamic elements.

Netcloak and Netforms, from UK-based CIS, extend HTML held on Macintosh Web servers to provide elements such as date/time and visitor counters. NetForms also allows site visitors to fill in and submit online forms.

NetCloak creates HTML pages that change depending on the situation. Pages can vary by time, date, the user's browser or IP address. In all, 14 new commands enable users to tailor pages, based on more than ten different variables.

With NetForms, standard HTML forms are created (for users to complete), formatted into new HTML files and placed on the server. Automatic navigation links allow Web authors to create an interactive Web site.

Both packages range from £129.95 for a single server, up to £799 for a site licence.



CIS 0181 255 0130
http://www.CoInS.co.uk

Spinning around the Web

Secret Agent

Nildram Software recently sent Cutting Edge a copy of its Secret Agent program. It's a neat little package that works with NetScape (all versions) and allows offline reading and browsing of Web pages.

You can visit sites you want to see, log off and read them later, offline, at your leisure. BT won't like this, but you will.

So instead of having to dial in to your ISP to view the Web pages you've already visited, Secret Agent looks at NetScape's cache and creates a site directory complete with graphics.

NetScape launches as a default when you click on any site in the list. Any links to other pages held in the cache will be honoured, but it won't allow you to link to sites not yet visited.

Nildram says it may support other browsers, depending on demand.

Secret Agent is distributed as shareware and costs £24.95 to register.

I recommend you download an evaluation copy from Nildram either at **http://www.nildram.co.uk/sagent** or from **ftp://ftp.nildram.co.uk/pub/ariel.**

Bayerischen Motoren Web

If you're one of Planet Internet's target young men about to buy your first BMW (see "Planet yuppy", page 242) you should take a look at the Bavarian car maker's new Web site which includes information on the complete BMW range.

As you might expect, the Web site is as beautifully designed as the cars themselves, and includes a Z3 screensaver to download.

http://www.bmw.co.uk/news.html

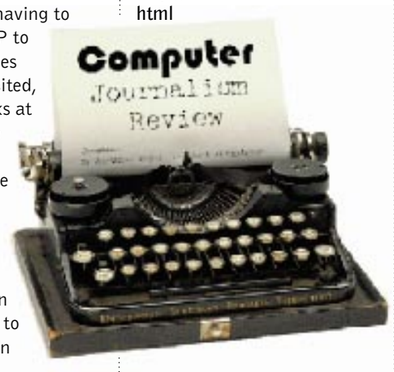
US, complete with links to their own Web sites.
http://www.dinkytoy.com/review/main.html

Gold blender

A definitely groovy site is Blender, brought to you by the people behind the Blender CD-ROM magazine.

Created to reflect the same alternative style as the CD-ROM, complete with a quirky sense of humour, it is one of the best designed sites I have seen.

If you're into US street culture, Blender is a fine place to go. Even if you're not, it's worth checking out as a fine example of Web design.
http://www.blender.com



Propeller-head hack heaven

A slightly self-indulgent site but nonetheless irresistible (especially for computer journalists), is the Computer Journalism Review.

This is a listing containing reviews of nearly every computer magazine in the UK and the

net.newbies

Getting started on the Net: what to do, where to go

These pages are designed to be an easy-to-use reference guide to the Internet for the novice. Here's an easy guide to the tools which will help you make the most of the Internet.

So what is the Internet?
The Internet consists of millions of computers interconnected in a global network. The number of users is difficult to measure, but those worldwide who can at least exchange electronic mail messages is estimated to be 30 million and growing.

What about this World Wide Web then?
It is *not* the Internet. It is a service on the Internet which uses special software known as Web Browsers (usually available free) to give users access to pages of information with pictures and multimedia instead of just text. About 15 million people around the world have access to the World Wide Web.

Sounds great. What do I need to get on?
A PC of almost any age can be connected to the Internet as long as you can plug it into a modem. You don't even need to be able to view graphics on your machine to look around (although it helps).

A modem allows your PC to dial in to another computer with a modem and communicate with it. They come in different speeds, from 2,400 baud to more than ten times that. When you are using the Internet, the speed at which things work is more likely to be limited by the speed of your modem than by that of your computer. Buy the fastest you can afford. An old 2,400 baud "V.22bis" model is fast enough to exchange electronic mail messages, but to send and receive files, or use the more exciting services on the Internet, a modem which runs at a speed of at least 14,400 baud "V32.bis" is vital. Fortunately, these have plummeted in price over the past few years and now cost as little as £100. If you have the money, go for a 28,800 baud V.34 modem. Over time, you'll recoup the added cost by reducing your phone bills.

Okay, I've got a modem. Now what?
For a modem to bring you information, it has to have a number to dial. This is where a "service provider" comes in — you have to subscribe to one if you want to get online. Whatever kind of connection you have set up, you will have to pay your phone costs on top of any subscription, unless you are lucky enough to get free local calls through a cable company. The bigger service providers will have the numbers you dial, PoPs (points of presence), scattered across the country so you only have to dial a local number.

If there's no company near to your home which offers Internet access, you may have to pay long-distance phone rates. Once connected, though, it doesn't matter where the information you are accessing is physically located: you are always charged at the same rate. A list of providers and telephone numbers is available in the panel below. For more details, have a look at the supplement banded with the January issue of *PCW*.

Full Internet access, which allows you to use email and Internet services for any amount of time, limited only by the size of your potential phone bill, costs more, currently between £8.50 and £15 per month. There are dozens of companies offering this kind of Internet access, none of them big enough to dominate the market. The basic service being offered is largely the same, although some higher-priced providers may claim to offer a more personal service or a better selection of access software.

Why don't I just join CompuServe?
Or you could try AOL, Europe Online, UK Online and MSN who all now offer Internet access and also have a large number of services of their own to which only their subscribers have access. These services include official technical support for hardware and software by electronic mail, online games, vast indexed software libraries and databases of business or consumer information. A monthly subscription tends to cost between £5 and £10 per month, plus a charge per hour if you are online for more than a set number of hours in that month. However, as the market becomes more competitive, prices are falling and CompuServe has recently announced some significant reductions.

Demon Internet is the best known and most popular of the standard Internet operators but doesn't cater too well for beginners. Perhaps better for the raw newbie is Easynet (although it only has PoPs in London and Edinburgh) or UK Online. The latter is a special case; a cross between an Internet provider and an online service. For £8.50 to £12.75 per month it offers unlimited access to the Internet, partially "censored" to make it safer for children to browse, plus access to online magazines and other services.

Any good service provider should provide you with appropriate access software when you sign up, and if you want to choose something different, most of it can be acquired online, free of charge.

PCW Contacts

AOL 0171 385 9404
CompuServe 0800 289378
email:70006.101@csi.compuserve.com
Delphi 0171 757 7080
email: uk@delphi.com
Demon 0181 371 1000
email: internet@demon.net
email: sales@demon.net
Easynet 0171 209 0990
Europe Online 0171 447 3400
UK Online 01749 333333
email: sales@ukonline.co.uk

If you don't understand what's written here or have any suggestions, please let us know. Contact **Paul_Fisher@pcw.ccmail.compuserve.com**, or "snailmail" (Internet-speak for the post) to the *PCW* Editorial address on page 12.

Innovations

Same space, new dimension

A UK-based company has generated an innovative additional aspect to data dissemination.

The use of telecoms by companies to distribute data is well established. There's a huge range of options, from bulletin boards and the Internet, to some very high-capacity fixed digital links. But the traditional wisdom on what happens at the front-end of these systems has been locked into the one-to-many, one-to-one and many-to-one scenarios.

One-to-one mostly carries an individual's traffic and messages and is essentially a manual operation. When it comes to disseminating corporate data — when the head office needs to send information to all its branches — then it is broadcast as an automated many-to-one process.

This has also been a primary application of floppy disk duplication within corporates who are increasingly turning to the 3.5in diskette to send updates and information to their branches and salesmen. It's fast enough, it's cheap and it's technology that every computer-owner possesses.

Sending information back to the head office can be formalised as a many-to-one function; the data, often in the form of customer and branch reports, being sent back to the head office to assimilate.

But this entire distribution concept is two-dimensional. It talks about the senders and receivers but doesn't deal with the dimension of the data itself: whether it's a single file to go to all recipients, different files to go to different groups of recipients, or individual files to individual targets.

Middle ground

In automated data broadcasting and duplication, the data is seen to be always the same. If you are intending to send individualised files in a one-to-many situation, or handle lots of similar but individualised files coming back from the field, then you are back to the manual sending of one-to-one.

But there is a middle ground where a company regularly wants to send out, or receive, individualised information that can be handled automatically as though it were the same file going out to everyone.

A typical situation is a head office sending out individual stock lists to their shops up and down the country; all extracted from a common database format, but each file containing individualised stock information.

A UK-based software/hardware company, Avco, has been looking at this area for some time and has generated automated two-way distribution systems for major banks, financial institutions and even education authorities. These can handle individualised files going to and from specific branches and clients, but in a way that looks like simple broadcasting of a single file.

The system is totally independent of the media, hence its name Anymedia and Anycoms. Using the same basic front-end software the system can distribute data either using comms (traditional modem or ISDN), or it can produce individualised floppy disks using a desktop disk duplicator to copy the disks in bulk.

Significant twists

On the face of it, Avco's systems don't seem that radical, but they give two significant twists to data distribution systems.

Instead of being a passive send/receive system, sending out a chosen file to a predefined list of people, this system works with the database. Using scripts, the distribution system can pull out the individualised files, or data, and then send them out just as transparently as if they were a single file for general broadcasting.

If the distribution format is disk-based, the system connects to the desktop duplicator which also has an automated printer on the end of it. Load the duplicator with blanks and it copies the individualised disks which are then printed with the customer's name, so there is no confusion about which disk goes to whom.

The second twist we have already covered, but not identified as being unusual, is the integration of automated data selection and manipulation within the distribution system itself. Selecting which files or data are to be handled during the send process is not common for a data broadcast or disk duplication system.

Full benefits

While selecting files to send to different points is useful, the full benefits are more obvious when the data is being returned and reports and data, from the many sites, comes back to the one office. As the files come in they can be automatically re-integrated into a new database so that the office can see the results without any further work.

If the data is disk-based then the returned disks are fed, in bulk, back into the desktop duplicator which is put into read mode, thus pulling all the files off the pile of disks and feeding the data back into the computer system.

This type of package is not an all-embracing system which can cope with completely dissimilar files — images one minute, text or databases the next. The innovation is to add the dimension of sending, receiving and manipulating different data files from different sites as though it were a simple broadcast or duplication procedure.

Tim Frost

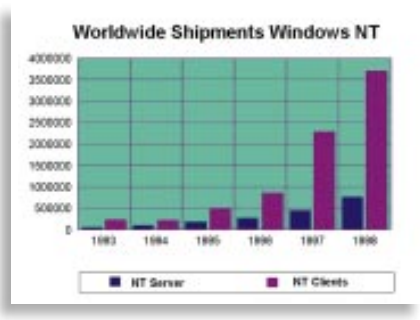
CUTTING EDGE

Horizons

Are you being **served**?

Microsoft plans to make NT a first class Internet server.

Microsoft has been announcing a whole raft of Internet strategies, many of which were designed to boost Windows 95 and the Internet Explorer 2.0. These, along with the introduction of Internet Studio (see PCW March 96), are largely aimed at the consumer and content providers for the Internet.



But the company was quieter about the development of Windows NT for the Internet, which in the long term promises to provide the company with much more. It's a 32-bit OS that can run on a variety of platforms, including RISC chips such as PowerPC. But it is as an Internet server platform that NT has proved robust and a less expensive option than traditional Unix-based servers. Many Internet servers already run on NT, thanks to its inclusion of TCP/IP protocols, 32-bit stability and performance close to Unix workstations.

Building on this, Microsoft will soon be integrating NT and a new Internet server solution which promises much. A major part of this is the upcoming Internet Information Server (IIS). Designed to run with Windows NT Server, IIS is a complete suite designed to take Internet servers beyond simple logging and administration. Aimed squarely at large business users, Microsoft IIS is designed to be a user-friendly way of controlling a complex Internet site (not just a Web site) from a single desktop PC.

There are a number of key features that will appeal to server administrators and Web masters. FTP and Gopher services can be configured from a single machine or several, but all can be integrated from within the Internet Service Manager, the software side that controls the IIS. All ftp and HTTP services are configured concurrently, without the need for separate servers.

Another clever part of IIS is its ability to control bandwidth access. This will come in useful if a site is proving a little too popular for its own good, causing frustration for those trying to log in and a headache for administrators trying to cope with demand. Instead, IIS limits the amount of information that can be sent from the server at any one time. This allows all services residing on the server (or servers) equal access to bandwidth resources, so for example a popular Web page should not prevent access to less popular ftp files.

Virtual servers? You got 'em. Microsoft is especially excited about IIS and its ability to allocate multiple TCP/IP addresses to a single server, without having to install multiple copies of the serving software itself. What this effectively means is that a single machine can have many thousands of Web pages held on it but made to serve from what look like separate machines.

Virtual Directories is equally intriguing. When a browser logs into your site it gets an ordered directory of pages looking as if they are ordered hierarchically on a single server. But in reality, IIS allows you to put pages on any server and it automatically configures access to give the illusion of a single, ordered site. This makes browsing and searching easier for site visitors; it will also work with Gopher and ftp services.

Visitor logging is also brought into a new phase of development. Currently, most Internet servers can only provide limited details of visitors, but IIS will allow logs to be rotated on size or how long the log has been in use. These logs can be automatically configured to log directly to Microsoft SQL Server.

Security is a worry, especially when servers are part of large sites, but IIS is expected to include new security controls. It will use Secure Sockets Layer (SSL), allowing bulk-encryption of data between server and clients. But it will also introduce a security system based around IP addresses; access or non-access can be based around TCP/IP addresses.

Microsoft IIS is still in Beta and in the hands of selected developers, but it should see the light of day by mid 96 at the earliest. For those already basing their Internet strategy around NT, it will come as a welcome addition to their set of tools. For others about to launch on to the Web, it could be yet another boost to Microsoft's attempt to dominate the Internet.

For those who care about such niceties, Windows NT in all its guises will also be given a Windows 95-style interface by the end of 1996 so you can have workstation performance and a pretty face at the same time.

PJ Fisher

● *A Beta of IIS should be in our hands soon and put through its paces.*

Bluesky

Gene genie

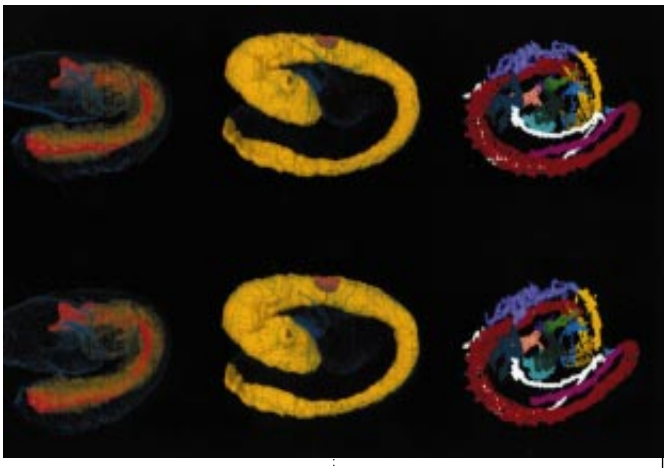
Developments in computing power have given the Mouse Atlas genetic research project exciting possibilities.

Investigations in the area of genetics, since 1900, have lead to some of the most exciting discoveries in modern biology. Developments in computing power over the next decade will make genetic research easier and will allow scientists to explore new aspects of this realm of science.

The Mouse Atlas project, based at the Medical Research Council (MRC) in Edinburgh, is one example of a genetic project which not only relies on recent investigative work into genetics but also the increased availability of powerful desktop computers.

The main aim of the project is to discover how different genes control the development of the foetus. This is not as simple as it sounds, however, as genes do not act individually but as part of complex networks of gene activity which control the development process.

Experiments around the world can show the patterns of gene expression for individual genes at selected time points (stages). The data is essentially pictorial. The purpose of the Mouse Atlas project is to gather this data from laboratories all around the world and map it onto a three-dimensional image of a standardised embryo. The data will be stored on a central server.



The pattern of genetic activity in the human ear

The means of visualising these images has been made possible by a Silicon Graphics Indigo. To give the sensation of the images being in actual 3D, not just on a flat screen, 3D glasses are used. This allows scientists to study and manipulate the image from various angles.

There are a number of other considerations to be taken into account. As *Fig 1* shows, the database can be divided into two sections: the relatively static Mouse Atlas of a fixed size, and the main database where data is accessed and contributed.

With laboratories contributing data from throughout the world, the amount of data stored could become huge; probably running into terabytes. The increasing amount of disk space available together with the decreasing cost, will make this possible. Unlike disk space, however, the price of RAM is almost static, which means that on a server like this, which may require around 1Gb RAM, costs will be high.

The main problem may not be the size of the database, however, but the speed of querying that database. To make this as fast as possible, database designers will look towards parallel processing. This technology allows several things to be done simultaneously and solves the problem of bottlenecks created by single-processor architecture.

Recent developments in the Internet also aid scientific projects of this nature. The database will probably be accessed by a page on the World Wide Web, with a password for security.

Even entirely new technologies may be used to make accessing the data easier and more sophisticated. There are plans to use Sun Microsystems' Java, an object-orientated language allowing users to integrate small programs, or applets, into Web pages. In this way, users of the database will not be held back by the hardware limitations of the server as the Web page will just download a program that executes, using the power of the user's machine instead of the server, and will then be dispensed with.

The 3D images created (such as the illustration shown here) require a large measure of number crunching by very powerful machines. But this isn't the end of the story.

As these images change with time, they can be considered as being four-dimensional. This again requires a substantial amount of computational power, especially if the 3D morphing is to be calculated in real time. The ability to create and view these four-dimensional images may become feasible with the development of virtual reality.

The Mouse Atlas, and subsequent database, is potentially one of the most exciting applications of developing technologies.

Jon Thaw

Fig 1 The two sections of the project

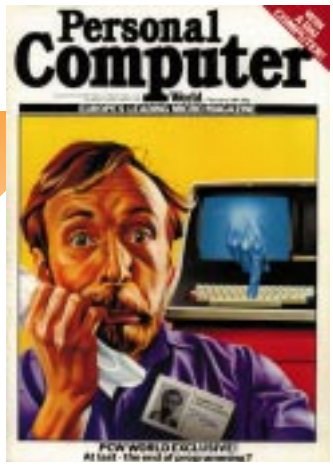
MOUSE ATLAS DATABASE	GENE EXPRESSION DATABASE
• Static	• Dynamic
• 3D images for each stage of development	• GE Database where data accumulates
• 2Gb	• Infinite size
• CD-ROM	• Terabytes in size

PCW Contacts

Thanks to Dr Richard Baldock at Edinburgh MRC.
Further information:
"Bluesky", *PCW* October 95; and "Hot Java", *PCW* February 96.

CUTTING EDGE

Retro



The program to **end** all programs?

The Last One was optimistically designed to put an end to the need for computer programs. Fifteen years on, programming is still a huge industry. What went wrong?

In February 1981 *PCW* ran the earth-shattering news that the last computer program that ever needed to be written had, indeed, been written. The program was called The Last One and its job was to create the programs you wanted from a simple description. "The system not only produces bug-free code, it does it jolly quickly," the review enthused.

The authors, Scotty Bambury and David James, had been drifting around the country and the world from job to job until David James inherited £1m and had some businesses to run. The Last One was the result of buying a computer to help manage one of those businesses.

This was not a program generator or a high-level language, but a completely new way of getting computers to program themselves. "You've found the philosopher's stone," was the first reaction.

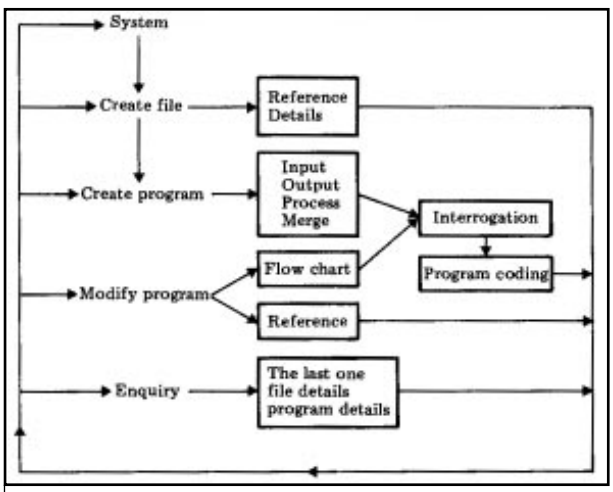
The artwork used for the article showed a very worried-looking programmer wearing the name-badge P. Allen (Paul Allen was Bill Gates' number two at Microsoft, so it's unlikely he's that worried).

The idea behind The Last One was that the user typed in broad design details for the program, the aims and objectives of the system, the number of files required and the number of programs in the suite. The Last One didn't pretend to do away with the systems analysis stage — the programs had to be built by defining the files first — but all you had to do was make selections.

"The point about The Last One," the review explained, "is that once you've given it a structure to work to it can then ask all the necessary questions to fill in the gaps in its information. It will be asking for details of the fields to be entered through the console, where to jump to, what key fields will be used to search the file and precisely what maths is involved.

"Once the answers to these questions have been given, The Last One gets on with generating the program code. It produces two versions of each program, one following the precise structure laid down by the program designer, the other using its own knowledge of the program structuring to optimise the code. It then benchtests each one, compares the results and churns the best one to disk (or tape)."

PCW's praise for The Last One was unbounded and included quotes from programmer Scotty Bambury saying: "Nobody told us it couldn't be done so we went ahead and did it." The magazine submitted a report to the DOI (Department of Industry) stating that The Last One "should be supported for its national importance" and that "a lot of effort should be put into exporting it and showing the rest of the world that British can still be best."



Outline structure of The Last One

No program is that good, not even Doom, and The Last One was not really a programming panacea but a 4GL producing programs in Basic. It couldn't cope with applications like word processors or spreadsheets but was a good rapid development tool. But it was over-hyped, and far too much money was spent on marketing. This was compounded by the hype being put into action before the software was finished. The result was that when the program went on sale, it failed to live up to the inflated expectations and became a niche market program, with Scotty Bambury using it to produce applications for the customer base. There was an ironically named The Last One 2.0, but there are still plenty of programs being written. And if Paul Allen is worried, it's not by the death of the software business.

Simon Rockman

CUTTING EDGE

BOOKS

The *PCW* review team reaches Warp FAQtor OS/2, despite playing in the MUD. Plus, the ultimate buyers' guide to computer tortilla chips and a small, square bug? Not to mention the games war.

OS/2 Warp FAQs
Authors Michael Kaply & Timothy Sipples
Publisher IDG Books
Price £28.99
ISBN 1-56884-472-7
Rating ✎✎✎✎✎

Entitled *IBM's Official FAQs* (Frequently Asked Questions) *for OS/2 Warp*, this book began life as an Internet FAQ list put together by Timothy Sipples, then a student at the University of Chicago. The list was constantly revised and edited until IBM got their hands on it and distributed it to their own sales force and technical support staff. Not surprisingly, Sipples was offered a job at IBM shortly afterwards.

This version of the FAQs has been put together with the help of Mike Kaply, fellow crusader from the OS/2 development team. The book comprises five parts, each with varying degrees of technical depth. The first few chapters give a broad introduction to OS concepts such as "multitasking", "multithreading", and "real" and "protected" modes. There's a detailed section on hardware compatibility with recommendations on the most compatible sound cards, CD-ROM drives and hard disk drives to be used with Warp. Not terribly useful information if you've already installed OS/2 on your system, but invaluable if you want to upgrade system components or you're thinking of trying out Warp in the future.

Part three is devoted to troubleshooting in OS/2 Warp and is full of the kind of intricate details which save you hours of sweat and grind. A whole chapter focuses on installation problems, while another gives the full technical monte on fine-tuning your system for optimum performance. Applications for OS/2 Warp are given extensive coverage in the fourth section looking at the BonusPak, OS/2 Warp Connect and OS/2's programming language, REXX.

Nothing is taken for granted in this book. Detailed technical sections are interspersed with explanations of basic concepts and there's plenty of useful cross-referencing from question to question. Don't expect comparisons though: this book has been written by the high priests of the OS/2 Warp church. If you can ignore the odd devotional hymn (I'm not joking, page 228 urges you to "sing along with the IBM theme song…") then this is a very useful book.

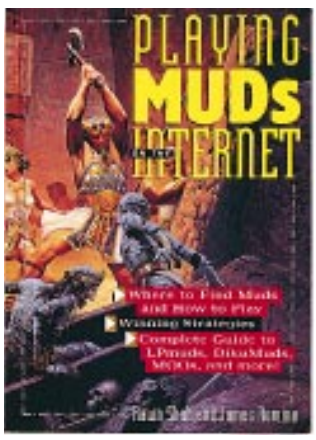
Eleanor Turton-Hill

Playing MUDs on the Internet
Author Rawn Shah and James Romine
Publisher John Wiley & Sons
Price £12.95
Pages 328
ISBN 0-471-11633-5
Rating ✎✎✎✎✎

There are two ways to look at MUDs (Multi-User Dungeons, where you role play in a fantasy world): you either love 'em or couldn't care less. When reading this book I fell into the latter category, but that didn't stop me from admitting that this is a valuable book if you fall into the former.

Shah and Romine obviously know what they're talking about, because they have managed to fill 328 pages of acid-free paper with intricately-detailed information on MUDing. The book covers two types of MUD: DikuMuds and LPMuds. A DikuMud is a series of interconnected rooms that make up a virtual world — a set of rooms makes a zone. The LPMud is a fantasy world all of its own.

Shah and Romine take the reader through the history and development of each MUD and then go into detail about how to enter, play and survive (which appears to be a key goal) while adventuring and fighting in the dungeon. Explanations are given as to the types of player and characters such as Groupies and Player-Killers, as are commands such as torment and ventriloquate.



The book also mentions the phenomenon of Mudsex (parents beware) even though all the sex is online, not real. It sounds truly fantastic, in the literal sense, and seems to be a not uncommon occurrence. Although the authors downplay this aspect of MUDing, one nevertheless gets the sense that there is more to it than meets the eye. Marriages, honeymoons, flings and (disturbingly) rape are mentioned as aspects of the game. But before you plunge into this part of the dungeon, the authors warn that "things are not really as they seem" — particularly where gender is concerned.

The book is a goldmine of tips, terminology and tricks of MUD play on the Internet. The language is simple but suited to enthusiasts. Anyone who has an active imagination and loves fantasy role-playing games should enjoy this. Other people may find they have better things to do.

Dylan Armbrust

Games War
Authors Michael Hayes and Stuart Dinsey
Publisher Bowerdean Publishing
Price £24.99
ISBN 0-906097-34-7
Rating ✎✎✎✎✎

Computer firms often make the mistake of thinking that computer games have something to do with computers. They don't. They are an industry apart. The computer games industry (which those within arrogantly call "The Industry") owes more to records and cassettes than to memory and hard drives.

How the games industry went

through its growing pains is the subject of *Games War*, a new book by the fiercely independent editor of trade paper CTW (Computer Trade Weekly), Stuart Dinsey, and Michael Hayes, former Nintendo marketing manager.

The mix of poacher and gamekeeper is unsavoury. The book aims to be a business review of the video games market, which in the UK is bigger than cinema-going or perfume. But in practice it reads like an extended CV for Mike Hayes.

There are some interesting anomalies. On the one hand, the book claims that in the mid-eighties the market dominance of Nintendo and Sega was assailable. They sold, according to Hayes and Dinsey, because they had the best machines, not because there was any brand loyalty. The book claims that any manufacturer with a sufficiently good product could have taken them on. This belief is sandwiched between the observation that some schools were "Nintendo camps" while others were "Sega camps", and the comment that the Atari Lynx, while technically superior to the Gameboy, was a flop because it lacked the right badge.

If history is written by the victors, then this is the propaganda of the games war. The book mentions development "slots" and the fact that by the time the Department of Trade and Industry got its teeth into regulating the games companies, the bottom had fallen out of the market.

What the book fails to do is explain how vicious the slot system was. Nintendo and, to a lesser extent, Sega had a legal hold over every game released. The console makers were the only people allowed to make cartridges and would sit as judge and jury over every product. They required a large lump sum from anyone who wanted the right to buy cartridges from them. They then limited the number of releases. It's as if IBM had said: We designed the PC. Only Lotus, Microsoft and Novell can produce software. We will duplicate all the disks and those three companies will buy them from us (at an inflated price). We will only take multi-million pound orders, and to keep the price of the software up, each company can only release three products a year. Bear in mind that Nintendo is twice as profitable as Microsoft and you can see why there was outrage.

The role of Nintendo's UK marketing department is viewed from a forgiving aspect. Marketing failure tends to be laid at the door of head office in Japan. Nintendo lost its market dominance first in the UK and then, as a result of this, in the rest of the world, yet for some strange reason this is not the fault of UK marketing. This book is written by the man who had the job of marketing Trivial Pursuit and Nintendo in the UK at their corresponding zeniths of world popularity — not, perhaps, the hardest job in the world. Making a success of marketing something no-one wants to buy would make much more interesting reading.

If you want a superficial overview of the games market (something that Microsoft senior management in the UK could use) then this book is worth reading. But if you are already in "The Industry", reading repeatedly about what a "great guy" Michael Hayes is may lose its appeal.

Simon Rockman

The Ultimate Computer Buyer's Guide
Author Greg Metz Thomas Jr
Publisher Wordware Publishing
Price £16.50
ISBN 1-55622-446-X
Rating ✎✎✎✎✎

You might be influenced by salespeople, advertising, and advice from friends and colleagues, even the occasional *PCW* review, but at the end of the day you make your own decision on what to buy. At last here's a book to hold your hand through that scary business of buying a computer.

The *Ultimate Computer Buyer's Guide* is supposedly "not overly complex" but it does go "deep enough into the important issues, allowing you to make intelligent buying decisions."

Don't let the introduction put you off — the American style and humour may not be to your taste. The author's outrageous comparisons of computer components with shirts, pants and socks, tortilla chips and a small square bug with lots of metal legs are at best unfortunate, at worst highly annoying. This description tops the lot: "The motherboard bus is not like a big yellow school bus with screaming children hanging out the windows, but instead is similar to a highway of information connecting the CPU with other hardware." Yeah, right.

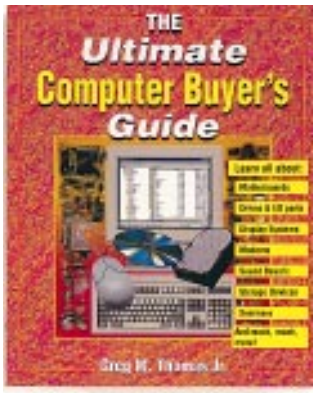
The book does contain some good advice and useful information, so it's unfortunate that these tiresome and patronising comparisons have been included. They only detract from the overall quality of the book.

The entire computer system is explained and there's a couple of excellent chapters on printers and printer technologies. Nothing has been forgotten: sound boards, graphics accelerator cards, video capture boards, different types of RAM, hard drives, modems, monitors, scanners; it's all there.

There are tips on what to watch out for and check when considering a purchase, although the last 30 to 40 pages are probably the most helpful. "Systems of Choice" offers guidance and advice through both low- and high-end recommended system specifications from general purpose, to multimedia and CAD.

Non-American readers probably won't appreciate the fact that all prices are in dollars, and all phone numbers and addresses all located in the US. Mention of the Fair Credit Billing Act (instead of the UK's nearest equivalent law, the Consumer Credit Act) is irritating to say the least.

Joanna Scott



Top Ten Books: April 1996

1	Doing Objects in Microsoft Visual Basic 4	Ziff-Davis Press	£37.49
2	Teach Yourself Web Publishing with HTML in a Week (Book/CD-ROM)	Sams.net	£26.95
3	Java! (Book/CD-ROM)	New Riders	£32.99
4	Inside Visual C++	Microsoft Press	£41.99
5	Web Page Design Cookbook	Wiley	£22.50
6	Teach Yourself Database Programming with Delphi	Sams	£37.50
7	Delphi How-To	Waite Group	£36.50
8	Microsoft Windows 95 Resource Kit	Microsoft	£46.99
9	Windows NT Server Professional Reference	New Riders	£50.99
10	Photoshop Wow! Book — Macintosh Edition	Peachpit	£32.95

List supplied by The PC Bookshop, 11 & 12 Sicilian Avenue, London WC1A 2QH
Tel: 0171 831 0022. Fax: 0171 831 0443

Kids' Stuff

It's been a busy month for Paul Begg and daughter Siobán. They found something which gave them paws for thought, and met Edna the chicken lady. And just what *is* the mane attraction? Aladdin? Oh yes it is, Oh no it' s not... Oh, what the heck.

Since Christmas, Siobán and I have looked at a lot of educational software and software for older children, so this month we thought we'd look at some titles for the younger age range — especially some of those titles we have neglected in the past.

PAWS

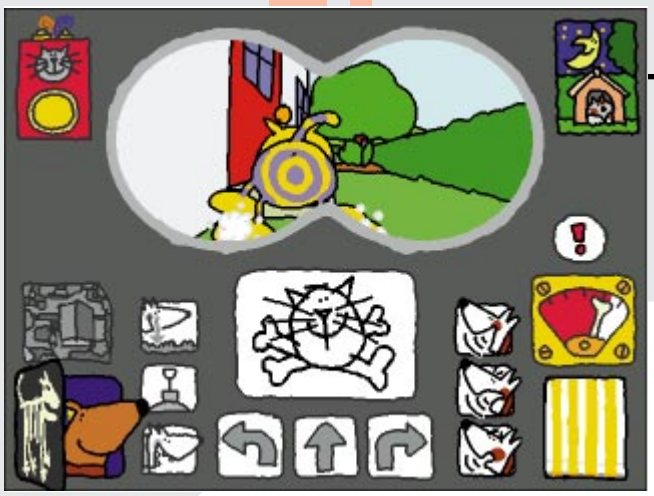
We begin on a light note with what is, I think, an expensive CD-ROM called PAWS. Although It has been available for the Mac for quite a while, it has only recently been ported to the PC.

Your Personal Automated Wagging System (PAWS) is a dog simulator. If this sounds a bit wacky, it is. But the CD won the Gold Award for Best Children's Title at the 1995 BIMA Awards in Cannes.

PAWS is designed to let you know what it is really like to be a dog and indeed it's amazing how quickly you can get deeply, emotionally excited about bones and chasing cats. It's a cartoon in the vein of the old Rhubarb cartoons you may have seen on television and everything happens from a dog's perspective. Imagine Doom, but instead of guiding a gun you guide the nose of a dog. Great fun, but too expensive for what it is.

The Lion King Animated Storybook

From dogs to lions: the Lion King ranks pretty near the top of Siobán's favourite movies. She has the video, a CD of the soundtrack, a Simba hot water bottle. a Simba soft toy… you name it. If she hasn't got it, she's wanted it. She therefore approached The Lion King Animated Storybook with instant love, even though she's a little older than the recommended upper age limit of nine years.



No paws or let-up when you're homing in on target

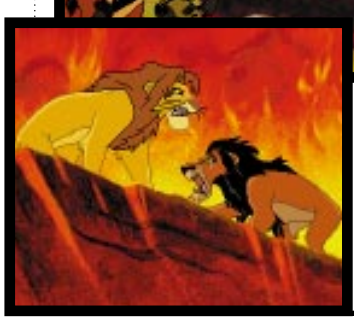
Her assessment of the software was somewhat more than tinged with bias, but this is actually the great merit of a title such as this. I have been driven nuts by getting Siobán to try something new because, like most kids, she likes to stay with what is familiar.

There's something scary about stepping into the unknown and the great thing about titles like The Lion King Animated Storybook is that children are familiar with the story and its characters. For young children especially, this familiarity encourages them to use the software (which can often be a bit of a battle).

There isn't too much to The Lion King. It's basically all the title says it is; namely an animated storybook. You can read each page yourself or sit back and enjoy having the pages read for you. When difficult or special words appear, an explanation can generally be obtained by clicking on Rafiki, the wise old baboon.

The graphics are bright and colourful and the CD-ROM features the voices of the original movie actors. The CD is also easy to use. Just listen to Timon the meercat's simple instructions and all but the very youngest children will be able to operate The Lion King.

In addition to the storybook,

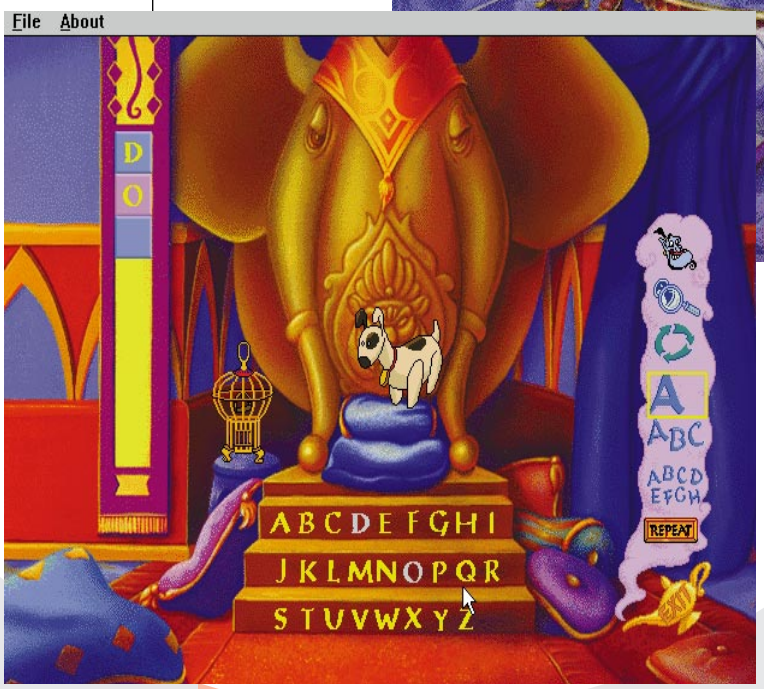


Above *Familiarity breeds content — if they loved the movie, they'll love the Animated Storybook. But it is a bit expensive*

Left *Graphics of the quality you would expect from Disney*

Right *The movie theatre — you can see clips from the Disney movie*

Below *It's not all fun. This is a simple spelling game*



there are three simple games. The Pouncing Game is actually quite fun; you have to help Simba creep up on Zazu the bird and pounce on her. But she turns every now and then and you have to hold down the mouse key for Simba to crouch within the long grass and remain hidden.

There is also a dot-joining game and a bug-catching game. The bug-catching game makes you snatch bugs for Timon as they scoot across the ground at ever-faster speeds.

These games are essentially designed to develop eye/hand co-ordination with the aid of the mouse. They are also bound to be firm favourites with lovers of The Lion King.

Aladdin Activity Centre

Another Disney product is the Aladdin Activity Centre. Although this is a collection of relatively simple games, you can choose from three stages of difficulty so all the children in your family can have fun. There are six reasonably long clips from the animated movie, too, and your guide throughout is the Genie. I should warn you, however, that his voice *isn't* provided by Robin Williams.

There are 11 activities in all. You can elect to enjoy them from the Agrabah Marketplace, the Cave of Wonders, the Royal Palace or the Sultan's Theatre.

If you are at all familiar with kids' computer games, none of the games presented here will be unexpected. There's a jigsaw, which is a memory game where you have to remember the location of matching cards. There are also a maze, matching, music and spelling games. Added to this is the art centre, where you'll find 16 pictures to colour. A particular special touch is the magic brush; just move the brush using the mouse and all the colours magically appear.

It is all fairly simple and basic, but young Aladdin fans will love it and use it. Beware, though: this software demands fairly powerful hardware; a 486 with 8Mb of RAM is the recommended minimum specification.

At about £45 (RRP) the price of both Disney packages (Lion King and Aladdin) seems a little on the steep side.

Selection from the Corel CD-Home range

In 1995 the Canada-based Corel Corporation launched its CD-Home range and throughout the year, new titles came along thick and fast.

Most of the discs were for children — though the series does include a very good movie database, which beats Microsoft Cinemania in its range of content. The children's software includes a collection of Living Books-type titles, based on the books by Alan Rogers and aimed at three- to six-year-olds.

Titles so far released include Blue Tortoise, Red Rhino and Green Bear. There are also a couple of discs in a series for four- to nine-year-olds, featuring a character called Nikolai. The first is called Nikolai's Trains and the series includes some games, too.

Tortoise, Rhino and Bear are inexpensive but captivating titles designed to help pre-schoolers come to grips with shapes, colours, tools and flowers.

Good fortune

I attended the BETT show in London, back in January (actually about a fortnight ago as I write this) — it's an educational software show — and I saw a lot of excellent and exciting software. Much is still in development, but some is already available and will be reviewed in these pages soon. I also saw quite a lot of very good software that has been around for a while but which I have missed for one reason or another.

One title I haven't managed to get around to mentioning is Kablam's Crystal Ball from KindWare, a software label which devotes 50 percent of its retail profits to a designated charity.

Kablam's is a multimedia fortune-telling program (which will even select lottery numbers). It's not actually designed for children, but the profits from its sales will go to the Save the Children fund. And by the way, throughout 1996 it will be bundled with every VTech PC sold by Crown Computer Products and 25 percent of the pre-loading licence fees from Crown will also go to the charity.

Children can even colour each page and their work can be printed out. One idea is to get a large notice board for your child's bedroom so that printouts of their handiwork can be pinned up, to reinforce the lessons.

Each page of the book has loads of hotspot animations (that is, somewhere on-screen that will produce an animated sequence when you click on it with a mouse). They are economically priced and worth looking at.

Above *From the Corel collection — Arcade Games really is on the duff side*
Right *Wild Games is a different matter altogether: plenty to do, lots of animation and easy instructions if you forget the rules*

Older children might like Arcade Mania, but frankly, don't let yourself be influenced by the claim on the disc that the games are "awesome" — they're far from it. The games are Nova 3, Neutrino and Lunar Fox and they are all pretty naff. If your children have experienced Doom, these games probably won't even get beyond a first glance.

Well worth looking at, however, is the far-superior Wild Board Games. The CD offers chess, checkers (draughts), reversi, snakes and ladders, and a switch puzzle.

You can choose to play in four different locations and you are faced with several opponents: Morton the monkey, Jack the rabbit, Benny the dog, Edna the chicken lady (why do these sound like the acts in a circus freak show?).

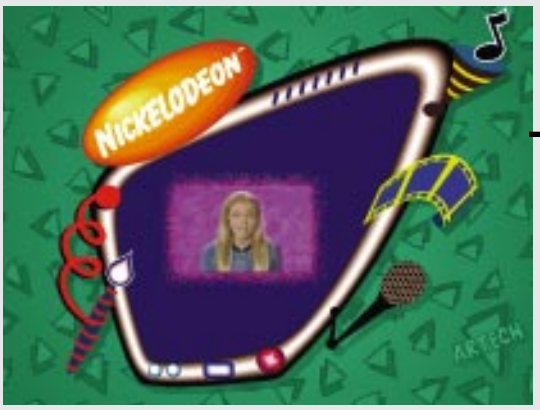
Both Siobán and I particularly liked the chess game even though our opponent, Jack, tended to divert concentration with his antics. Siobán, who has a passion for snakes and ladders that far exhausts the patience of her parents, was delighted to discover this computer opponent.

There are over 1,500 animations and there are some other activities hidden away, including animated videos and a noughts and crosses game. Although their locations are given in the manual, children will probably derive more fun from searching for these themselves.

The help which children can access for guidance to the rules of the games was especially helpful. This provided tips on strategy and even advice on the best moves. You can't always be around to explain what a rook or a knight can do — with most computer chess games the instructions are for adults and quite often hidden. With Wild Board Games, the rules and instruction are easy to access, the advice is for kids and is easily understood.

I should warn you that on one machine I couldn't get Wild Board Games to work — a

CUTTING EDGE



Director's Lab — Clarissa Explains It All. Melissa Joan Hart is your guide to what to do and how to do it

friend also encountered problems loading it. On the machine Siobán uses, however, it loaded without trouble and worked fine, except for a notice which repeatedly popped up, stating that the sound might not work properly with the default configuration. The sound did work okay, though, and after a while I disabled the notice.

Are You Afraid of the Dark: The Tale of Orpheo's Curse/Director's Lab

We get so much software to look at each month that sometimes stuff just slips by, even when on the face of it there is everything to recommend it. Two titles to have suffered in this way are Nickelodeon's Director's Lab and Are You Afraid of the Dark: The Tale of Orpheo's Curse. If you have satellite television, you'll undoubtedly be familiar with Nickelodeon; one of four children's channels and probably the best (though the recently arrived Disney Channel offers stiff competition).

Even if you don't have satellite TV, you'll probably be familiar with some of Nick's more superior programmes such as Rugrats, Doug and Clarissa Explains It All.

Director's Lab, hosted by Melissa Joan Hart (who plays Clarissa in the above-mentioned Clarissa Explains It All), gives children the opportunity to combine text, graphics, sounds, and so on to make a mini film. It's good fun, but just misses. Siobán liked it at first but soon moved on and, to the best of my knowledge, hasn't returned.

Are You Afraid of the Dark: The Tale of Orpheo's Curse, is a different kettle of fish. For those not familiar with the series: a group of children who call themselves the Midnight Society meet in a secret place on the darkest of dark nights. They gather around a crackling log fire which barely penetrates the gloom that envelopes them, and tell a scary story.

You are a new member of the Midnight Society; the teller of the story of Orpheo's Curse. The story begins with an old, closed theatre. Two children go in to investigate. They search for a way in, but all the doors are locked. Then, mysteriously, a door opens. The children enter to be greeted by a headless ghost. From this point onwards, the story is yours: you explore, you go here or there, you react to whatever happens. How you react dictates the course of the story.

Are You Afraid of the Dark runs under DOS and is fairly demanding of system resources, but it runs well and I can tell you that Siobán loved it. In fact, when her friends come round it is one of the CDs most often requested. It has been in the shops for a while, but if you get the chance to play with it, do give it a try.

PCW Details

Kablam's Crystal Ball
Price £12.99 (inc. VAT)
Contact KindWare
Tel 0181 203 6078
Rating (n/a — see panel on page 260)

PAWS
Price £34.99 (inc VAT)
Contact Digital Garden/Virgin
Tel 0181 964 6000
Rating ★★★★☆

The Lion King Animated Storybook / Aladdin Activity Centre
Price £44.99 each (inc VAT)
Contact Buena Vista
Tel 0171 605 2400
Rating ★★★★☆ (each)

Blue Tortoise, Red Rhino, Green Bear, Nikolai's Trains[1]/Arcade Mania[2]/Wild Board Games[3]
Price £19.99
Contact Channel MarketMakers
Tel 01703 812755
Ratings ★★★☆☆[1]
★★☆☆☆[2]
★★★★☆[3]

Director's Lab[1] /Are You Afraid of the Dark: The Tale of Orpheo's Curse[2]
Price £29.99[1] £49.99[2]
Contact Viacom New Media
Tel 0181 849 9433
Ratings ★★★☆☆[1]
★★★★☆[2]

CUTTING EDGE

CD-ROMs

Pick your way across the globe: risk rattlers in the Sonoran desert or search for lost civilisations. An Italian job satisfies armchair Ferrari fanciers. Back home, there's help to pass the new driving test (*before* you buy your dream car). And there's an all-British encyclopedia, too.

The Hutchinson Multimedia Encyclopedia 1996

This last of the batch of '96 encyclopedias is one worth waiting for. Developed by Helicon and Attica, it is the only encyclopedia of its type to be wholly conceived and compiled in Britain. This makes a refreshing change to US editions tweaked for the UK market.

The Hutchinson has certain advantages over its rivals, and its Britishness is evident from the start. The cover includes pictures of such UK personalities as Hugh Grant, the Princess of Wales, Tony Blair, and Damon Albarn from Blur.

Once inside the CD, you find a complete and cogent approach: if you choose a subject such as British history, the list of articles that appears is extremely detailed.

Unfortunately, the entries for each reference are not as detailed as one would wish. Compared with Encarta, they look positively skimpy. A lot of thought has been applied so you can get the facts without having to read screeds of text, but the entries do not contain the sort of background needed to make them stand alone as explanations of each subject. As a result, you must navigate between entries to get the full picture, rather than navigating to pursue a train of thought.

For example, when reading about John Maitland (second Earl of Lauderdale) in Hutchinson's I found it useful to read all the related articles, whereas the Encarta entry gave me everything I needed in one place. While this does not detract from the quality of the individual entries, it does mean more flicking around to find what you are looking for.

The other elements of the disc are well constructed. The browse button flicks up the beginning of a bunch of articles and you can choose what to investigate. The Timeline feature is particularly good, the emphasis is firmly on British history, but important world events are also covered.

(1) *The Hutchinson Encyclopedia covers all the greats. From the Roman Empire…*

(2) *to Hugh Grant of Four Weddings and a Funeral… and a Scandal, fame*

(3) *Navigate between entries to get the full picture*

This is one of the better encyclopedias for the British market and, at the same price as Encarta, is worth serious consideration.

Adele Dyer

The Hutchinson Multimedia Encyclopedia 1996
Contact Attica 01865 794561
Price £49.99
Rating ●●●●○

(1) *Meet hissing Sid along the trail*

(2) *Owl be seeing you — in the Sonoran desert*

Sonoran Desert — A Multimedia Field Trip to the Cactus Desert of Arizona

If you never miss a wildlife documentary on television, and love traipsing about in the woods leaving no stone unturned, reach for your hiking boots.

Sonoran Desert shows you that not all deserts are vast expanses of sand with only a few cacti dotted around to break up the landscape. In Arizona there's an abundance of bird, mammal, reptile and insect life supported by a thriving plant population.

Your desert guide explains how to explore in your initial training session: by moving the cursor around the screen you'll reveal "hot spots" where animals might be hiding, or where a trail exists for you to follow.

When a magnifying glass appears you can take a closer look at something, usually without the subject running away. Close-up pictures, animal sounds or further "zoom in" pop-ups may be accessible as well as movie pop-ups.

Back at base in the Gila Field Centre, you can attend geographical and ecological lectures. Visit the media room in order to consolidate your notes, and check identification and classification of plants and animals using the various terminals and resources.

Once you're out in the desert, the scenery and sounds are impressive. There's superb photography and video, supplied by the BBC Natural History Unit, and when you come across a landscape or animal that you really like, you can use your camera to take a photograph and the image will go into your photo album.

You can use your check list to mark off the sighting or write further observations in your notebook. You carry a satellite receiver too, which is actually less exciting than it sounds. There's some interesting information on unisex lizards — and don't miss the really bizarre Mole Lizard.

The creatures do "move" (albeit behind the scenes) around the desert which adds some realism, but what you see once won't necessarily be there again. Don't expect some Harrison Ford meets David Attenborough type of action-adventure. This is a field trip for discerning wildlife enthusiasts (children and adults) and while being entertaining, it does require a methodical approach.

Joanna Scott

Sonoran Desert — A Multimedia Field Trip to the Cactus Desert of Arizona
Contact Ransom Publishing 01491 613711
Price £39.95
Rating ●●●○○

The Search for Ancient Wisdom

This CD-ROM by Bea and Bob Connolly is the result of a commission for the couple to make a TV series about world religions. Turning their eyes to the distant past, they became increasingly interested in artefacts and legends which, they suggest, are the relics of an advanced ancient knowledge.

Their project gradually changed course. Retaining an overlay of investigating world religious beliefs, they explored subjects as diverse as Atlantis, the lost cities of South America, Easter Island, the pyramids, the Ark of the Covenant and the Dead Sea Scrolls.

It is a book on a CD-ROM. There are 13 chapters, including

The Interactive Guide to Ferrari Road Cars

(1) *Driving a Ferrari around Silverstone? Dream on, boy racers*

(2) *A Ferrari frenzy of info*

There is, perhaps, no car manufacturer more revered than Ferrari. The prancing horse logo is to aficionados of moving metal what Pelé is to football, or Buster Keaton to comedy. It is the stuff of folklore, and chronicling such a sainted subject often invites hostility from devoted followers. It is against this background which The Interactive Guide to Ferrari Road Cars must be judged.

This is an authoritative interactive encyclopedia. It gives a lot of information on Enzo Ferrari, too; a man many Italians regard as second only to the Pope. Following his death, when one of his scarlet racing cars won the first Grand Prix after a long period without victory, it could only have been an act of God.

The CD-ROM looks at the cars produced for road use, although much of the excellent video footage is shot at Ferrari Owners Club days and shows the cars on the track. Enzo Ferrari made road cars only to finance his racing. Often, one race car was sold off for road use in order to finance the next race car, so much of the early history is patchy. The disc has more detail on later production cars, with each one documented and photographed.

The main menu is a gear lever, showing the famous Ferrari open gate. You grab the ball top and slot it into gear to choose between the categories. A silver 512BB is reflected in the ball. The idea is good, but moving the virtual gear stick using a trackball can be as difficult as the real thing before the gearbox has warmed up.

The sound is good and jaunty. It supposedly offers audio tracks; I blame my inability to get this feature working on an uncooperative audio CD player.

Most of the CD contains an encyclopedia of the models, specifications, build dates and quantities, exploding the myth that the factory intended to produce 270 288GTO models but made one more for Nikki Lauda. This is good anorak stuff and the meat and potatoes of coffee-table books. The most exciting bit of video footage is a lap around Silverstone in an F355 as a commentary talks you through the racing lines. It's what schoolboy fantasies are made of.

This disc is clearly the result of a passion: it's well produced and will withstand the harsh criticism often attracted by anything that deals with a quasi-religious topic. I cannot quite believe there are no mistakes in anything this detailed, but I couldn't find any.

Simon Rockman

The Interactive Guide to Ferrari Road Cars
Contact Global Beach 01734 342699
Price £29.95
Rating ●●●●❍

an introduction and conclusion, plus an index which lists subjects by page number. Atlantis, for example, is referenced on four different pages.

There is a lot of video, too; in fact almost every page consists of a short piece of text and two narrated video segments. The "video book" idea is a novel concept and an exciting way to explore the subject matter. But Ancient Wisdom is also a journal of the Connollys' globe-trotting adventures, a travel guide providing information about how to visit many of the sites referenced.

Sadly, this CD-ROM doesn't wholly succeed in combining these elements. It fails because the Connollys don't provide

anywhere near enough information about the "ancient wisdom" for which they have been searching.

They attempt to let you go beyond the superficial narration and call up an expanded text on many topics, but in most cases this was insufficient. In the course of one discussion, for instance, they mention the contribution of Edgar Cayce. A mouse click can take you to additional textual information about him, but it's very sketchy. This could have been made more comprehensive; perhaps even to the extent of including one of Cayce's own books, or a full-length biography.

I really wanted to know more about some of the subjects, and could happily have wallowed in quite complex arguments about this or that bit of minutiae. After all, the proposition that there was an "ancient wisdom" — for example, that Atlantis was the home of a technological super-race with aircraft — is based on the interpretation of the available evidence.

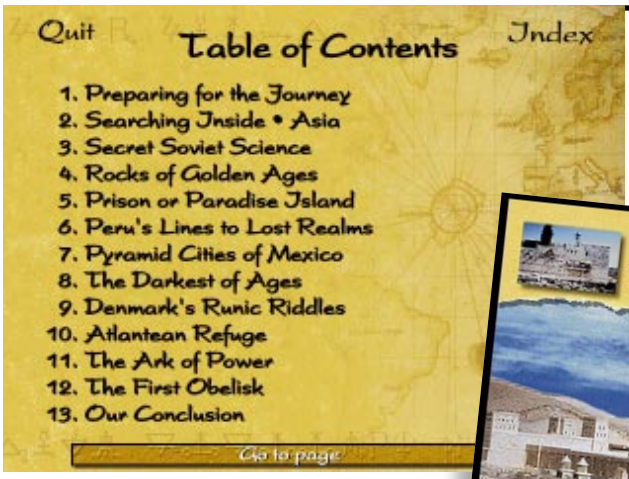
A detailed assessment of the evidence is what you hope the disc will provide. It doesn't. I suspect this is because the Connollys are film-makers and don't really know their subject. For instance, there is no mention of the island of Santorini, widely regarded as the remains of Atlantis, which even in terms of a travelogue is a big disappointment.

Ultimately, this CD-ROM is really an off-beat travelogue rather than a serious search for evidence of "ancient wisdom". Viewed as such, it would have made a good video and cost roughly a third of the CD price. Frankly, £20 is a lot to pay for the addition of some text and an index.

Nevertheless, this is an interesting disc that almost succeeds in making effective use of CD-ROM to investigate a fascinating subject.

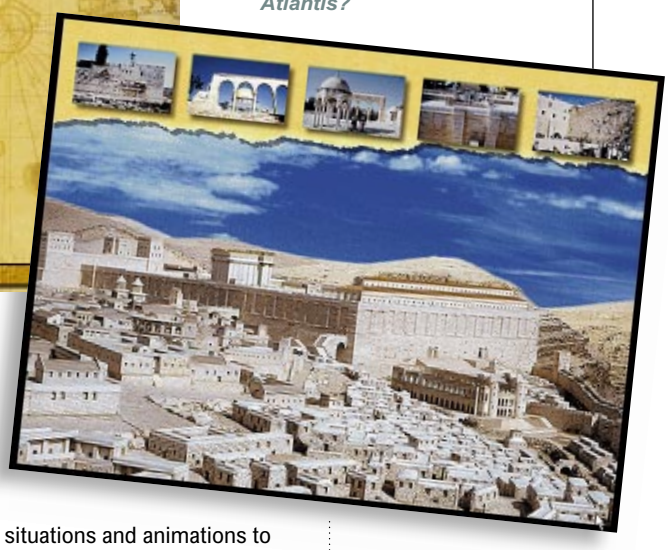
Paul Begg

The Search for Ancient Wisdom
Contact World Library
01993 778077
Price £29.95
Rating ●●○○○



Left *A recipe for research into Ancient Wisdom*

Below *Your hotel complex (artist's impression) in sunny Atlantis?*



The Driving Test — Your Licence to Drive

With effect from July, the driving test will have the addition of a written theory section which all driving-test candidates must sit.

Polco-Belcar, which calls itself the UK's largest car accessory and car air-freshener supplier, has launched a CD-ROM to help would-be drivers prepare for both the theory and practical driving parts of the test.

As Pelco-Belcar's first foray into CD-ROM production this could have been dreadful, but the result is quite pleasing. The idea behind the disc is to quiz the user on the questions they are likely to face in the theory tests. These cover everything from road signs and the highway code to hazard perception, observation and planning.

To liven up the quizzes there are video clips of certain situations and animations to illustrate accidents. The whole package is really quite entertaining and will test your knowledge without your having to pester friends, family and almost any stranger to ask you questions on the highway code.

Adele Dyer

The Driving Test — Your Licence to Drive
Contact Polco-Belcar
0181 560 6405
Price £29.99
Rating ●●●●○

"When I tap the dashboard, I'd like you to bring the car to a haaaaaaalt!"

Charts

Top Ten CD-ROMs March 1996

1	Encarta 96	Microsoft
2	Cinemania 96	Microsoft
3	Girls, Girls, Girls	Guildhall
4	Incident at Roswell	Omnimedia
5	Encarta 96: World Atlas	Microsoft
6	3D Garden Designer 2	Europress
7	Pamela Anderson Screen Saver	Telstar
8	Rolling Stones: Voodoo Lounge	Virgin Interactive
9	Bodyworks 4.0	Softkey
10	AutoRoute Express: UK & Ireland	Microsoft

Screenplay

NEWS

Games 95

In a bid to gain a firmer grip on the games market, Microsoft has announced a partnership with several leading developers. The company's Entertainment Group has signed a deal which will deliver more titles specifically for the Windows 95 platform.

The developers include Crystal Dynamics, famed for its work on 3DO, Rainbow America and Terminal Reality. Microsoft has worked with the latter's technology to produce its own title, Fury3.

Among the products planned are a conversion of the hit platform game Gex, a racing simulation, and a title based on World War II.

Crash and burn

Following the recent success of titles such as Micro Machines 2 and Destruction Derby, Microprose is about to jump on the bandwagon with Track Attack. Billed as a hard, fast arcade-style game of driving and destruction, it marks a departure from the company's regular simulations.

Track Attack is set in the near future and claims to have the best graphics yet seen in a racing game. Along with 13 challenging tracks there are shortcuts, barriers, catapults, oil spills, fires and jumps to make things more exciting. New effects will give a realistic motion blur on the car, a heat haze on the horizon, smoke and exhaust flames. Qsound technology has been used and, best of all, there's a four-player network option.

Microprose 01454 326532

Charts

HMV LEVEL ONE

1	Worms (CD)	Ocean
2	FIFA 96 (CD)	EA
3	Command & Conquer (CD)	Virgin
4	7th Guest — White Label (CD)	Virgin
5	Rebel Assault 2 (CD)	Virgin
6	Screamer (CD)	Virgin
7	Day of the Tentacle — White Label (CD)	US Gold
8	Rebel Assault 2 (CD)	Virgin
9	Championship Manager 2 (CD)	Domark
10	Championship Manager 2 Italia (CD)	Domark
11	TFX EF2000 (CD)	Ocean
12	The Dig (CD)	Virgin
13	Warcraft 2 (CD)	Zablac
14	Destruction Derby (CD)	Sony Int
15	Encarta 96 (CD)	Microsoft
16	Beavis & Butthead (CD)	Viacom
17	Indiana Jones: Fate Atlantis (CD)	Virgin
18	Star Trek The Final Unity (CD)	Microprose
19	Grand Prix Manager (CD)	Microprose
20	Actua Soccer (CD)	Gremlin

Sierra in space & 3D

Leading games creator Sierra On-Line has announced two new Windows-only CD-ROM titles. First for release is Space Bucks, a strategic simulation that has you transporting human and extra-terrestrial beings to the four corners of the galaxy. It's up to you to negotiate right of way, open up new routes, charter vehicles and generally run the space-age version of British Rail. Just to make things interesting, you have three rivals who won't think twice about resorting to sabotage, bribery and all manner of dirty tricks to take your business from you.

Available since February, Space Bucks offers high-resolution 3D graphics, substantial use of video and a stereo soundtrack.

Further down the line is the next big graphic adventure, Lighthouse. This time you play a babysitter whose charge is suddenly stolen by a mysterious "black being" from another dimension. As the child's safety is your responsibility, it's up to you to travel through the same space-time gateway to a parallel universe and rescue the little tot before it's too late. Entirely modelled in 3D, a first for Sierra, Lighthouse is a blend of science fiction, fantasy and fairy tale. You won't be able to play it until June, though.

At the time of writing, prices had not been set for either game.

Sierra On-Line 01734 303322

BEAVIS AND BUTT-HEAD in Virtual Stupidity

Uh huh huh...like this game is really...uh, huh, huh...cool...

When a game opens with a warning that it's like...uh huh huh…not real… like it's only a cartoon so don't try to copy it, then you know it's going to like, rule, or something.

Virtual Stupidity gives Windows 95 users a chance to interact with TV's two favourite losers, Beavis and Butthead. The game starts in science class with our heroes trying to connive their way out of class and then out of school in order to join Todd's gang.

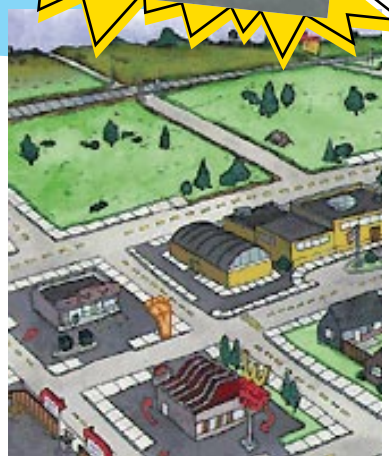
What you, as Beavis and Butthead, have to do, is walk, talk, collect and touch (yuck!) your way into and out of situations until you find their jail-bird role-model.

Each sequence in Virtual Stupidity is filled with the typical repartee you'd expect from our two friends. Watch Butthead ask to go to the washroom — "Uh… don't worry, we'll wipe." See Beavis drink water from the spraying water fountain — "Hee, hee, cool", or hear him speak fluent Spanish: "CarandacarundatrrrandacarundaBUNGHOLE!"

As Beavis and Butthead, you get the pleasure of being a nuisance to just about everyone and everything you meet.

There are mini-games within the game, as well, and they like… rule, too. You get to Hock-A-Loogie (that's "spit", to you uncool dorks) on people from the school roof or fire a tennis ball cannon at yuppies. There are a couple of other like… really cool ones but we won't mess up the surprise for you.

This is like…uh… a really tasteless game but it's also kinda…uh… funny. It's appeal, however, may be limited to those who have seen Beavis and Butthead on late-night television or the MTV channel and who have a high threshold for bad taste.



However, the presentation is top notch and the game has the look and feel of the actual cartoon. The resolution of the game depends, naturally, on your PC's graphics card and monitor but overall it's not at all bad. You get three screen-size settings ranging from a small, clear, window to full-screen, but the full-screen quality sucks.

It's not a slow-paced game either, but you may find yourself replaying a few scenes because they're so funny.

Oh, and, like… one last thing. You find yourself, after prolonged game playing, thinking and talking (aahh!) just like them and that can…like… drive your friends psycho causing them to tell you to…like… buttoff! Don't listen to them — just go play the game again 'cause it like… really does rule.

Dylan Armbrust

System requirements You will need a really cool PC, with a minimum 486 33MHz processor, SoundBlaster or 100 percent-compatible sound card, double-speed CD-ROM, mouse, 8Mb RAM, local-bus video card and Windows 95.
Price £29.99
Contact CIC Video 0181 846 9433

Hexen

Beyond Heretic

More medieval mayhem from the people who do it best. Id's hexy stuff.

When Id Software crossed the legendary Doom with swords and sorcery, the result was the chart-topping 3D shareware adventure, Heretic. Hexen is the long-awaited sequel, which could prove to be more popular than the original.

The idea of Hexen is to work your way through the levels to save a magical land from an evil being known as Korax. You can choose to play as a fighter, a cleric or a mage, and each comes with a different range of weapons and capabilities. A fighter is best at close combat and starts out with a pair of spiked gauntlets, while a mage comes as standard with a long-distance shooting wand.

The more you play, the bigger and better the weapons you find, including such delights as the Porkulator and the Hammer of Retribution.

Hexen is as easy to get into as Doom, and just as difficult to get out of. The graphics are smooth, with plenty of nice touches, and the sound is up to Id's usual standard. Hexen allows you to play an audio CD soundtrack through your PC to accompany the game. It doesn't sound quite right with Kylie Minogue singing in the background, but the score from Conan the Barbarian suits the game perfectly.

This is definitely one for hack-and-slash adventure fans. Hexen seems destined to stay in the charts for some time.

Chris 'Cleric' Cain

System requirements 486DX 33MHz or higher, 8Mb, VGA, 25Mb hard disk space, SoundBlaster-compatible sound card. Network/serial link or modem required for multi-player option.
Price £44.99
Contact GT Interactive
0171 258 3791

Cybermage

Don't judge a game by its cover. Cybermage may look slicker than David Wicks in a Brylcreem frenzy, but Doom it definitely ain't.

Ooh, what a sexy box this game arrives in. The images on the front remind you of a Heavy Metal comic book, and we all know how good those are. It contains three booklets and the game CD-ROM. Two of the booklets carry information on installation and game instructions. The third is a comic-book history of the Cybermage "outside" the game. It's a good read and I didn't want it to end. Too bad this wasn't the case with the game itself.

It begins with the Cybermage awakening from "incubation", metamorphosing and having to escape pursuers who want to capture and kill him. Not knowing what his task is, he sets out to find information and break free. He's endowed with special powers that allow him to shoot an energy burst from his fist.

Cybermage doesn't break any new ground and if you've played Doom you won't be impressed. Firstly, installation was a problem. I had a hard time getting sound and only after three attempts and a complete driver reinstallation did it recognise my sound card. Then there's the graphics. Even at 640 x 480 with 256 colours, I was unimpressed. There are too many key-based functions complicating the game, even if you use a joystick.

The verdict is boring and overpriced.

Dylan Armbrust

Minimum requirements 486/66-based PC or higher, DOS 5.0 or higher, minimum 8Mb RAM, SoundBlaster-compatible sound card, Microsoft-compatible mouse, double-speed CD-ROM or higher, (S)VGA graphics card.
Price £49.99
Contact Electronic Arts
01753 549442

CUTTING EDGE

SFPD Homicide

Gumshoes of the world, renounce your joysticks for a cybersleuth challenge.

Do you prefer problem-solving games to the slash'em and blast'em genres? If so, you'll enjoy playing this interactive multimedia game.

SFPD places you in the role of rookie homicide detective. You are called to your first case to investigate the discovery of a body in San Francisco Bay.

From then on you build your case by identifying the body, talking to witnesses and trying to find the culprit. The catch to all this is that you only have two weeks (in game time) to solve the murder or you will be taken off the case. Luckily, you have a partner who gives you guidance along the way.

The game is good fun and intellectually challenging. There is no violent action to contend with as it is meant to test your ability to solve a mystery.

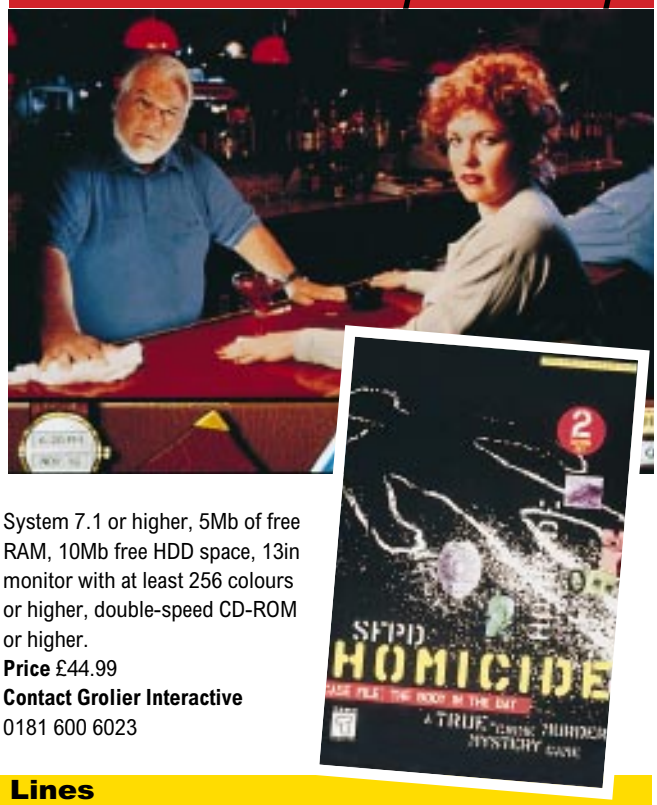
The format is simple (just click and point) but you still need to know how to assemble your information so you can find, arrest and charge the correct suspect without getting sidetracked on a wild goose chase.

One nifty aspect to this game is its multi-platform capability. It can be played on either a PC or a Mac, so you don't need to buy two versions. It's a nice change, and worth trying.

Dylan Armbrust

System Requirements
For PC 486/33 or higher, Win 3.1 with DOS 5.0 or higher or Windows 95, 8Mb RAM, 10Mb free HDD space, SVGA video card and Windows-supported sound card, double-speed CD-ROM or higher.
For Mac 68030/25 CPU or higher, System 7.1 or higher, 5Mb of free RAM, 10Mb free HDD space, 13in monitor with at least 256 colours or higher, double-speed CD-ROM or higher.
Price £44.99
Contact Grolier Interactive
0181 600 6023

Case File: The Body in the Bay



Leisure Lines

Brainteasers courtesy of JJ Clessa.

Quickie
In the sentence shown on the right, each letter has been replaced by another. Spacing and punctuation have been left unchanged from the original. Can you decipher the message? (*A clue is given at the foot of this page.*)

Dpk dbkdbk bkkyb bkd dv kbdceuwbp wdbkus cb dpk jkcjuwkbd dhctbywddkh vs jwbkcbkb.

This month's prize puzzle
Three secretaries, Alma, Beryl and Celia, went to their local branch of WH Smith to buy various items of stationery. Their purchases are shown in the list below. Each girl bought exactly four items. Alma spent exactly £8. What did she buy?

Item	Total cost
● Rubber bands	£3.94
● Paper clips	£0.34
● Notebooks	£3.71
● Desk diary	£4.59
● Pencils	£1.41
● Typewriter ribbons	£4.67
● Sellotape	£3.21
● Felt tip pens	£4.69
● Postage stamp	£0.01
● Loose-leaf binders	£5.55
● Rulers	£3.87
● Envelopes	£1.65

Answers on a postcard or the back of a sealed envelope, please (no letters or floppy disks) to: PCW Prize Puzzle — April 1996, P.O. Box 99, Harrogate, N.Yorks HG2 0XJ. To arrive no later than 20th April 1996. Good Luck!

Winner of the January prize puzzle
A huge response to the January crossnumber puzzle — proving just how easy it was. We received almost 400 entries: all of them seemed correct.

Anyway, from that enormous pile, our random number generator selected the card from Mr Peter Bray of Llandaff, Cardiff. (Wales seems to be on a winning streak — last month's winner was from Gwynned.)

Congratulations, Peter, your prize is on its way.

Meanwhile, to all the nearly-wons, keep trying — it could be your turn next.

The solution is shown here.

■	3	9	4	8	6	7	2	3	■
9	2	4	0	8	8	1	7	■	6
7	0	■	2	1	9	4	4	8	0
3	5	5	6	8	8	■	6	8	2
3	5	4	8	■	6	7	0	6	1
■	1	6	3	1	■	6	1	8	6
4	6	8	■	7	2	4	3	0	1
3	2	8	2	6	0	1	■	4	4
0	■	8	9	8	7	5	6	7	1
■	8	3	3	9	6	6	7	2	■

(*Clue to cryptic message: find what the second word is.*)

Win an HP CD-writer

HP SureStore CD-Writer 4020i

Hewlett-Packard is generously offering three CD-writers for grabs this month. The SureStore CD-Writer 4020i is a highly desirable piece of equipment and could be the answer to all your backup prayers, as well as being perfect for recording music CDs, creating Photo-CDs and distributing information.

The CD-R, which combines a double-speed writer and quad-speed reader, is capable of recording up to 650Mb of data or 72 minutes of audio on a single formatted CD-R disk. As part of the deal you get two blank CD-R disks, a SCSI-2 interface card and software including Magic Lantern and Easy-CD.

Q1. To win one of these CD-writers, just tell us how many megabytes of data you can store on one formatted CD-R disk:

a) 650Mb
b) 750Mb
c) 850Mb

Xircom CreditCard Ethernet+Modem 28.8

Xircom PCMCIA modems

For the ultimate in mobile connectivity, Xircom is giving away two combined Ethernet and modem PC cards. The high-performance CreditCard Ethernet+Modem 28.8 is ideal for any notebook user who needs to log on to their network both in the office and when out on the move.

In addition, there are three CreditCard Modem 28.8s to get you connected wherever you are. Using V.42bis compression, the CreditCard Modem 28.8 is capable of delivery speeds up to 115.2Kb/s.

Q2. To win one of these superb modems, just tell us how many Kb/s the CreditCard Modem 28.8 can deliver using V.42bis compression:

a) 152.1 Kb/s
b) 115.2 Kb/s
c) 511.2 Kb/s

Hutchinson Multimedia Encyclopedia 1996

Fancy a brand new, completely up-to-date British Encyclopedia? We have ten copies of the Hutchinson Multimedia Encyclopedia 1996, donated by Attica, to give away. For a full review turn to page 264, but suffice it to say that it's one of the best we've seen this year. It has a staggering 2000 new entries, over 150 video and 100 sound clips, over 5000 quotations, and comes packed with goodies such as an atlas and a quiz.

Q3. To win one of the ten copies, just tell us how many quotations are on the CD-ROM:

a) over 5000
b) over 2000
c) over 4000

Rules of entry

This competition is open to all readers of Personal Computer World except for employees, and their families, of VNU Business Publications, Hewlett-Packard, Xircom and Hutchinson. Entries to arrive by 19th April 1996. The Editor of PCW is the sole judge of the competition and his decision is final. No cash alternative is available in lieu of prizes.

How to enter

To enter the competition, just write your answers on a postcard, along with your name, address and daytime telephone number, and send to: April Competition, Personal Computer World Editorial, VNU Business Publications, VNU House, 32-34 Broadwick Street, London W1A 2HG.

Hands On is the place where readers can contribute to ***PCW***, and as always we'll pay for anything we use. Macros, sections of code and hints and tips will be rewarded with a £20 book or record token (please say which you'd prefer) and we'll pay hard cash for longer, more involved pieces. Please include relevant screenshots in **.GIF** format.

All submissions should be emailed to the author of the appropriate section, or snailmailed to Hands On, *Personal Computer World Editorial*, VNU House, 32-34 Broadwick Street, London W1A 2HG. Questions and short hints and tips can be faxed on **0171 316 9313**.

We're constantly working to improve the contents of Hands On. If you have any suggestions, send them to the ***Editor*** at the address above, or email them to **editor@pcw.ccmail.compuserve.com**

Box of **delights**

Tim Nott keeps it small and sweet with a selection of delectable shareware utilities and other goodies. And for those feeling jaded with mammoth applications, these are strictly lightweight.

After last month's descent into the bowels of the Registry, I thought we all needed a break. Well, I certainly do. So this month we'll take it easy with a look at some new shareware utilities, a selection of your letters and email, and ten more tips.

We've grown so used to the assumption that "bigger is better", what with 70Mb office suites and 26Mb fax packages, that it's wonderfully refreshing to see some genuinely tiny applications. First out of the box is Trayexit, weighing in at a small but perfectly-formed 21Kb. If you're tired of seeing the Shut Down Windows dialogue, then this is for you. Run Trayexit (preferably from a shortcut in your Startup folder) and you'll be rewarded with an icon of an open door in the System Tray — the recessed part of the Taskbar that contains the clock. Left double-click exits Windows, right double-click restarts your PC — both without further ado. You do of course get prompted to save any open files. And that's it, except to say that it's by Joe Cotellese (joecot@netaxs.com.), it's free, and like the rest of the utilities mentioned here, it's on the CD-ROM (Trayexit.zip).

Lunar module

One question must be oft on the mind of PC users: "What is the current phase of the moon?" It is this, after all, that apparently controls many Windows 95 settings, and from which we get the word "lunatic". So let's give a warm welcome to the Beta version of Locutus Codeware's Moonphase, well worth the sacrifice of 54Kb of disk space. Another one for your Startup group, this deposits an icon in the System Tray showing the current state of that influential celestial body. Linger the pointer over the icon, and a pop-up will give the age of the moon* in days. Be careful, though; the documentation warns that due to the non-linear rotation of the Earth and the difference between ephemeris and universal time, the lunar date is not 100 percent accurate. The Harvey algorithm used is only accurate to one day, so don't go scheduling your favourite rite — such as a full hard disk back-up — by it. Locutus is at http://www.wimsey.com/locutus, and registration for this shareware product is a very unastronomical $3. The author, Argun Tekant, can also be contacted on CompuServe — 76300,2572. Look for Moonphas.zip on the CD-ROM.

*And before you all write in complaining that the moon is billions of years old and there wouldn't be room on the screen for all the digits, I'm talking phenomenologically rather than selenologically.

Little Imp

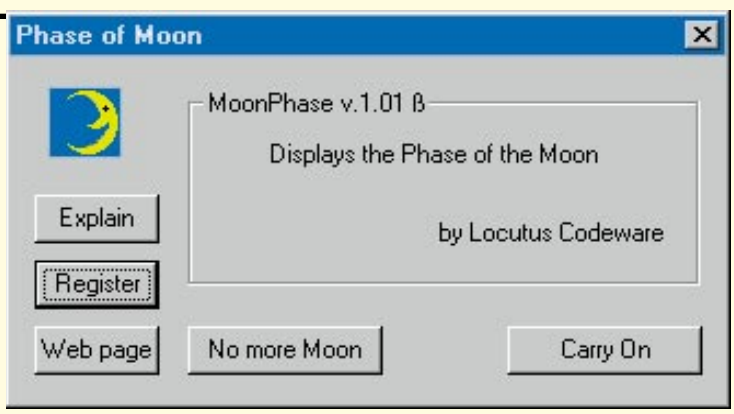
A third contender for the Startup/System tray stakes is George Harth's Imp Virtual Window Manager (http://www.kent.edu/~gharth). If you've ever used anything like Bigdesk or Dashboard, which give you multiple desktops on which to park applications, then this might interest you. The icon in the tray lets you turn Imp on and off, as well as accessing several options. With Imp turned on, you get a small but resizeable free-floating grid showing miniatures of up to nine virtual screens. Windows are shown as plain white rectangles on this, with pop-up titles, and you can drag them from one section to another — the real Windows will follow suit. Right-clicking on a section switches the desktop to the contents of that section, though the Start bar and all Desktop icons "move" with you.

With "Motion Switching", moving the mouse pointer to the edge of the screen jumps to the adjacent Desktop. This takes some getting used to: I was starting to get motion sickness as the screen suddenly lurched from this column to a screen full of blue sky; but you can adjust the sensitivity of this feature or turn it off completely.

Other options include customising the colours on the mini-screen and, amazingly, this all packs into 68Kb. It's shareware, not freeware, and registration is $15. Look for Impvwm.zip on this month's CD-ROM, and please do read the documentation — there are limitations with screensavers.

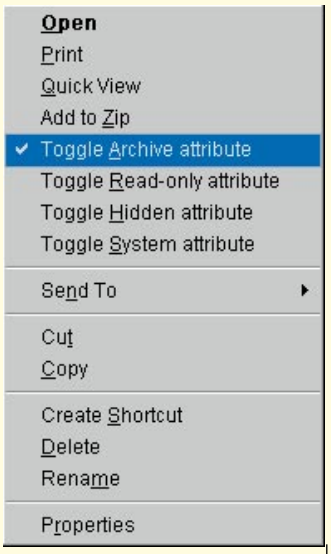
One-note Samba

Postit is yet another utility for the System Tray. Double-click on the little yellow square, and, as you may have guessed, a little yellow Post-It style note appears on the Desktop, into which you can type text. Unlike similar applications, such as Notez or Winpost, you can only have one note, and there isn't a bell or whistle in sight. The note isn't resizeable and can only contain eleven lines of text — about 320 characters, which are saved in an .INI file between sessions until you delete them from the note. You can select some (or



Sheer lunacy — the highly enjoyable MoonPhase from Locutus

with Ctrl + A, all) of the contents and copy to the clipboard as normal. You can't change the font or colour — in fact, the only option is "always on top". I can't make up my mind whether I like it in spite of, or because of, these limitations, but like it I do. It's great for those moments when you suddenly need to jot something down — an idea, a reminder, a phone number — and you can't find a pen or be bothered to load your word processor, contact database or to-do list. The Readme file makes no mention of registration so I assume it is freeware, and well worth 34Kb of anyone's hard disk. The author can be contacted at Mathieu-MARCIACQ@Coktel-Vision-FR.ccmail.compuserve.com, and Postit.zip is the file to look for on the CD-ROM.



Whatever happened to...
File attributes

Since the System Tray is now getting rather loaded, we'll move on to the Context (right-button) menu while still maintaining the "Small is beautiful" theme. Remember File Attributes? In File Manager, you had the option to view whether a file had its System, Read-only, Archive or Hidden attributes set. In Windows 95, you have to dig into the Property sheet to find this out.

To install, unzip Attrmenu.zip into a temporary folder, right click on Attrmenu.inf and select Install. When I tried this, the installation routine complained it couldn't find the .DLL, even though the path in the dialogue box seemed correct. This seemed to be a

Top Ten Tips & Tricks

1. Autoplay To disable Autoplay of audio CDs and CD-ROMs by default, go to Control Panel/System/Device Manager. Select your named CD-ROM drive — you may have to expand the generic CD-ROM or SCSI controller entry by clicking on the plus sign. Click on the Properties button, then the Settings tab. Click on the tick by Auto insert notification to remove it.

2. Explore or Open? Shift + double click on My Computer, any of the icons in it or any folder Explores, rather than Opens, the drive or folder.

3. Folder icons Though you can't change the default icon for a folder — well, I haven't found a way — you can change that of a shortcut to a folder, which is useful if you have shortcuts to folders on the desktop or in a Favourites folder. Right-click on the shortcut, choose Properties, select the Shortcut tab and hit the Change icon button.

4. New folder You can create a new folder on the fly when saving a file from a Windows 95 application. Choose Save As… from the File menu, then use the drop-down Save in list to navigate to where you want to create the folder. Click on the button which has a folder icon with a star on one corner. The new folder will be created — type in a name to replace the default New Folder.

5. Paint A great improvement on the old Paintbrush is that you can now Undo up to three actions.

6. Taskbar You can move this to the top or sides of the screen by dragging. Resize by dragging the edge nearest the centre of the screen. Move by dragging an "empty" part of the bar: you may have to close down some windows to do this, but using a steady hand you can drag on the tiny area between the buttons.

7. Start menu Ctrl + Esc is the keyboard shortcut for clicking on the Start button. Now read on…

8. More start menu Use the keyboard to jump to an entry on the start menu by typing an initial letter. If you have more than one entry with that initial, type the letter again to cycle through them. This works at any level, so if, for example, you have shortcuts for Paint and Phone Dialler and a sub-menu for Publishing, then the first P will highlight Publishing (sub-menu folders get listed first), another P will highlight Paint, a third Phone Dialler. Pressing Enter will then start the program, or open the sub-menu so that you can repeat the process.

9. Yet more start menu If you right click on the start button, select Open and re-order the icons, this has no effect on the order they appear in the menu. Annoying, isn't it? A workaround is to rename them with a number in front of the name. Sub-menus will still precede programs, but each will be arranged in their own numbered order, e.g. 1 Utilities >, 2 Games >, 1 WordPad, 2 Paint.

10. Even more start menu (yawn) Drag any object from the Desktop or a folder and drop it on the Start button. This will add a shortcut to the first-level Start menu.

Points of view

Fellow journalist Alexander Singleton wrote from Purley, with some complimentary winks and critical nudges, referring to my "going on" about how Office Applications put the application name before the document name. He points out that this is because of the Windows Interface Guidelines for Software Design, as published by the Microsoft Press. According to this, programs supporting a single document interface (such as Notepad, where you can only have one file per instance of program) should put the filename first in the Title bar or Taskbar button. However, the multiple document interface (MDI) is implemented differently, for a very good reason. If the "child" window — the one containing your document — isn't maximised, what would you place on each title bar? He writes: "You'd have to have the application name on the 'parent' — the application's — window, and the document name on the 'child' window." Which is, of course, what happens. He continues: "Now, if you were to maximise the 'child' window so that it fills the 'parent', what would you do?"

Well, I'm obviously still missing the point, as it seems logical to me to have the "parent" window titled as "active document — application". Alex has a more interesting idea, though: "It would be better for each new Word file to appear in a separate window, have a separate Taskbar icon, and do this with only one copy of the program loaded. What do you think?" I think I rather like that idea — what do you all think?

Architect Michael Hohmann of Kent had been having no luck installing Windows 95 on his 20Mb 486, even with a freshly formatted C: drive with "nothing on it but a freshly installed DOS and Windows 3.11." Hohmann reports that it always fell over at the "setting up your hardware" message. "For over a month I have been talking to Microsoft Support, but nothing they came up with worked. In desperation, I copied my old CONFIG.SYS and AUTOEXEC.BAT files from Windows 3.1 into the root directory. Hey presto, Windows 95 began to load fully and ran."

It gets a bit confused here, but it seems that he had edited the existing .SYS and .BAT files to pick up the new (32,935 bytes dated 11/07/95) rather than the existing (29,136 dated 31/05/94) HIMEM.SYS. Now, if I've got this right, he was trying to install Windows 95 over Windows 3.11 while the latter was running the former's HIMEM.SYS. Which must rank high in the catalogue of self-inflicted injuries. If I've got this wrong, and he means that Windows 95 won't run with its own HIMEM.SYS, then I apologise and confess I'm equally baffled.

Chris Dane faxed from Rugby stating: "I'm not sure whether you know of the Tips file in the Windows Directory, but it gives Hints and Tips for Windows 95 you have featured already… and more which have not yet been featured." Yes, Chris, I did — but I was hoping many readers had overlooked this. I have a living to make and sources to protect here, so cannot possibly confirm the existence of "TIPS.TXT". Oh, and lose three points for saying "Directory" instead of "Folder".

Russell Gardner thanks us for including the Powertoys on the February CD, but adds: "Shouldn't there be some sort of install procedure?"It is explained in the Readme file, but not very well. Having unzipped the .ZIP file and/or run the .EXE, you should have a folder containing all the separate Powertoys and several .INF files. Right click on an .INF file and you'll see an Install option.

Colin Mahoney emailed from Barcelona to complain that: "The default behaviour on inserting a CD-ROM is to start up the Autorun program if present. So every time I inserted the Win95 CD to look something up in the Resource Kit, it starts up that daft program with the pictures of clouds and Microsoft propaganda. This is not only highly annoying, it's also dangerous in that it provides a pathway to your hard disk for viruses which might be lurking on the CD."

Well, not on the Windows 95 CD, we sincerely hope. But I agree, it is annoying, and potentially dangerous with CDs of dubious provenance. We've already had this tip — it was published in October's issue — but holding down the shift key when inserting a disk prevents the CD Autoplaying. For a more permanent solution, see this month's Tip 1, which should also please Ashley Beeson, who emailed me with a related problem.

I'd like to chip in here, and say I find it equally annoying that having closed the "daft program with the pictures of clouds", double-clicking on the CD icon in the "My Computer" folder just starts it up again. This is because the default behaviour — shown in bold in the right-click menu — is Autorun. To avoid this, right click, then select Open or Explore.

Turn off autoplay for CDs

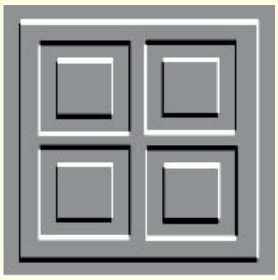
Bug of the Month

To continue the Iberian theme, reader Miguel Sérgio Branco brings tidings of joy from Oporto with news of a bug in Word and Excel 7. If he selects Help/About…, presses any alphanumeric key followed by F1 he gets: "This program has performed an illegal operation and will be shut down." And no, he hadn't been sampling his city's famous product, because the bug happens here, too.

long filename problem, cured by the Browse option. A 28Kb .DLL will be added to your System\Shellext folder, and whenever you right-click on a file you'll see four new entries, one for each attribute. Clicking on each toggles the attribute, with a tick for on. Further good conduct points are awarded for the correct use of the Uninstall option in Control Panel/Add-Remove Programs. Attrmenu is free, and is written by Frenchman Patrick Philipott (72561.3532@compuserve.com, or http://ourworld.compuserve.com/homepages/mainsoft.

PCW Contacts

Tim Nott can be contacted by post via *PCW* or by email at **timn@cix.compulink.co.uk**



Old **drivers** never **die…**

…they just lose their resolution. Tim Nott tells you about buses, DRAM, VRAM and redundant driver files. DOS is dealt with, too, as a new regular feature of this column.

Alan Semple emailed me with what must be a common problem: having upgraded his display card, installed the drivers, then upgraded those a couple of times, the list of available drivers in Windows Setup has grown alarmingly. He's tried removing the driver files from the System directory but this makes no difference. We covered this topic, in passing, in last year's grand spring-cleaning article, but let's take a closer look.

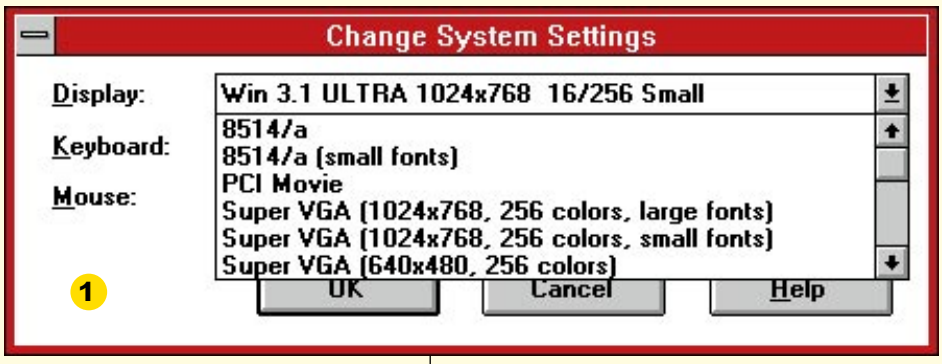


Fig 1 *All the lonely drivers — where do they all come from?…*

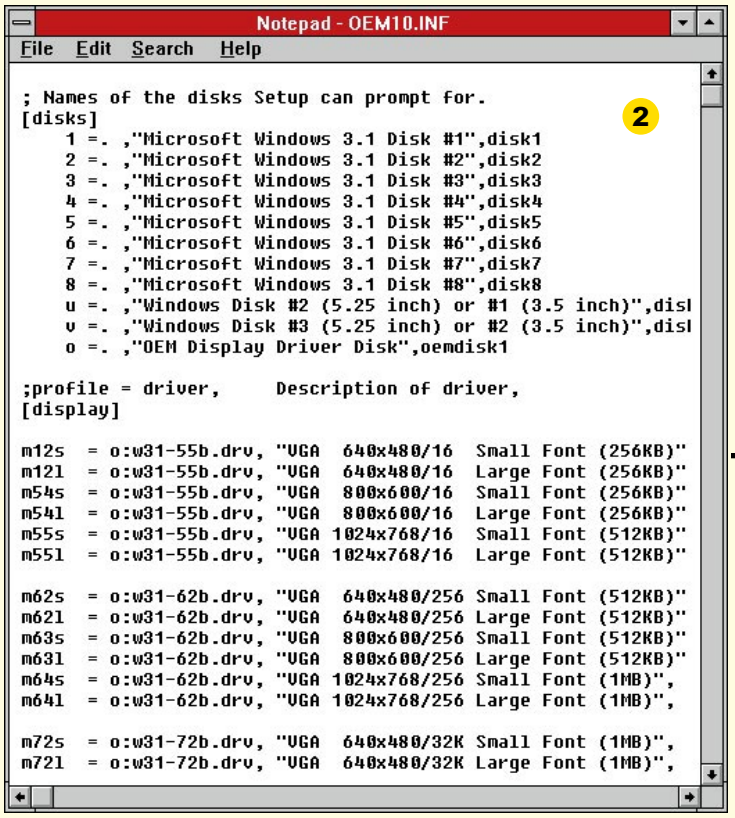


Fig 2 *…they come from the OEM*.INF files*

Drivers and grabbers

Although we speak of "installing a driver", several files are actually involved.

Firstly, the driver itself; the *.DRV file. There may be just one of these, with a separate utility for changing resolution, or a separate file for each resolution/colour depth.

Next, there are the "grabbers"; files ending in .2GR (standard mode) and .3GR (386 Enhanced) which support copying text and graphics in Windows DOS sessions.

Then, there's the Virtual Device Driver (VDD*.386) for displaying DOS applications in "Virtual Machines" in 386 Enhanced mode. And it doesn't stop there: each resolution may have a different set, or choice of fonts (*.FON). Some of these, like VGASYS.FON, are used by Windows itself; others such as EGA80WOA.FON are used in DOS sessions by the "grabbers".

Finally, the card manufacturer may include *.LGO and *.RLE files to replace the standard startup screen.

A brand-new installation of Windows offers support for a small range of display drivers, including VGA, SVGA, Video 7 and 8514. The instructions, for which files get copied from whence to where, are contained in a file named SETUP.INF, located in the System directory. Browse (but don't alter) this in Write because it is too big for Notepad, and you'll start to get the idea.

Third-party vendors use their own file, of the form OEM*.INF — Setup looks for these, too, and reports on anything it finds. So even if you've removed all the actual driver files, their ghosts will linger on if the OEM*.INF file remains.

We'll look more closely at the .INF files (how they work and how they can help you remove redundant drivers from your system) next month, but now let's move on to a related issue.

Can it go by bus?

Andrew Melville wrote from Bristol to ask what it all means: he's thinking about upgrading his display card, but is totally baffled by buses, DRAM, VRAM and all that. He asks whether I can recommend a good Windows display card?

Taking the last question first, the answer is, I'm afraid; no. I don't have hands-on experience of the many cards on offer, but we did run a group test in last May's issue of *PCW* and another is planned for June.

I can help Andrew narrow down the choice, however. In general, "accelerated" display cards (which is just about all of them) work by subcontracting from the main processor. To put it simply, instead of the CPU sending all the pixel-by-pixel information needed to display a green circle on screen, for example, it just sends the command "Draw green circle" and lets the chip on the card get on with the job.

The bus route

The first consideration is how the information gets from the CPU to the card: the "bus" route. This is dependent on your existing motherboard. Older PCs will probably have the standard ISA bus, with a bank of slots in which to fit display, sound and other cards. More recent ones will have a "local" bus — a separate set of slots. Of the two local bus standards, VLB and PCI, the latter has proved the most successful and is the platform on which manufacturers are concentrating their development. So if you have a PCI motherboard, go for a PCI card.

The amount of on-board memory determines the resolution and colour depth. For standard VGA, the screen consists of 640 x 480 pixels. Each pixel can be one of sixteen colours, taking up half a byte. The total screen memory needed, therefore, is 153,600 bytes.

However, this display is woefully inadequate for a desktop machine. Many games and multimedia applications need at least 256 colours.

The practical minimum is a card with one megabyte of RAM which will provide you with 1,024 x 768 x 256 colours (768Kb), 800 x 600 x 65,536 colours (937Kb), or 640 x 480 x 16,777,216 colours (900Kb). This last, taking three bytes per pixel, is also known as True or 24-bit Colour. Two megabytes will raise these limits to 65,536 colours at 1024 x 768 or 16,777,216 at 800 x 600.

Two hundred and fifty-six colours is also known as "palletised": each image is displayed using a set of 256 colours drawn from a possible 16.7 million. While this is perfectly adequate for things such as multi-media encyclopedias, you need more for serious image work; Kai's Power Tools, for example, won't work with a palletised display. Such a display can also cause clashes. When two images "fight" for the palette, the loser is displayed in the wrong colours. Very serious graphics buffs might be looking at 32-bit colour at 1,280 x 960, needing 4Mb.

Dynamic or video?

DRAM or VRAM? This one's simple. VRAM is faster (it has separate in and out pathways) and is more expensive. Another essential is refresh rate — check first what settings your monitor can support and look for a minimum of 72Hz vertical refresh rate at the highest resolution you use. Anything less may cause flicker; for the same reason, avoid anything "interlaced". From then on, it's bells and whistles — AVI and MPEG video acceleration, video capture, or the ability to connect add-on cards for these.

Finally, if you play DOS games, check out the performance under DOS as some Windows-specific cards perform badly in this area.

The new DOS section appears overleaf

DOS and Don'ts

This column has now taken DOS under its wing. But since we're all still recovering from recent issues' mammoth sessions on optimising CONFIG.SYS and AUTOEXEC.BAT for Windows, I'll confine this month's coverage to some short tips.

Fig 3 *A slash and a question mark gets brief help on most DOS commands*

● **Help.** With DOS version 5 and later you can get a brief explanation and a list of available options by typing a forward slash followed by a question mark after the command (*Fig 3*).

● **More Help.** DOS also has its own extended help system — typing "HELP BATCH", for example, will tell you all about batch commands. "HELP" on its own gives a list of topics.

● **DOS under Windows. (1)** Don't try to run disk utilities (e.g. chkdsk or scandisk) from a Windows DOS session; at best it won't let you, at worst you can corrupt your disk.

(2) You might like an on-screen reminder when in a full-screen DOS session under Windows, so don't do daft things such as the above, or worse, turn off the PC. Method one (thank you, Barry Moore of Northumberland) is to create a text file called WINDOS.BAT consisting of two lines:

```
@PROMPT Windows is active! $p$g
@COMMAND
```

Load Windows and highlight the DOS Prompt icon. Select "File/Properties…" and change the contents of the "Command Line" box to "WINDOS.BAT".

(3) An easier way to get a reminder is to use an undocumented Microsoft feature and add the line:

```
SET WINPMT = Windows is active! $p$g
```

to AUTOEXEC.BAT. In either case you can use your own message.

● **Redirection.** The ">" symbol after a command will redirect the output of that command. For example, "DIR > LPT1:" will print the contents of the current directory rather than show it on screen. "DIR > MYFILES.TXT" will save the list to a plain-text file — an especially useful trick under Windows, which has no way of doing this from File Manager.

● **Directory listings.** The "DIR" command has many options or "switches" — see my Help tip (*above*) to get a list. You can make one or more of these options the default by using the "DIRCMD" environmental variable. For example, the most irritating thing about the unadorned "DIR" is that the listing scrolls off the screen before you get a chance to use it. If you add:

```
SET DIRCMD = /p
```

to AUTOEXEC.BAT, then it will default to pausing between each screenful.

● **More directory.** Note that if you combine the previous two examples, your PC will appear to grind to a halt when redirecting a listing to file or printer as it's waiting for you to "Press any key to continue…". A more elegant solution than stabbing away at "Any key" until it has finished is to turn off the "pause" option on a one-off basis by preceding the same switch with a minus sign:

```
DIR /-p > MYFILES.TXT
```

does the trick.

● **More redirection. (1)** Redirecting to a file with the ">" symbol will overwrite any existing file of the same name — you don't get a "File exists…" warning. If you want to add to, rather than replace an existing file, use ">>" instead.

(2) It's not just the DIR command that can be redirected. One especially useful trick is to print, or save to file, the brief explanation of commands and switches mentioned in my Help tip (*above*) for future reference:

```
PROMPT /? > LPT1:
```

for example, will print out the low-down on customising your DOS prompt.

PCW Contacts

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A new **dimension**

There are few things more weird and wonderful than the sights that might await you as a result of tinkering with 3D graphics. In his first column for PCW, Benjamin Woolley puts you in the picture.

Welcome to the 3D zone

This is our latest addition to the *Hands On* section and deals with the subject of 3D graphics. Writer Benjamin Woolley has tussled in anger with the technology for the purposes of TV and a little bit of World Wide Webbery. The package he knows best is 3D Studio, but most, if not all, of what he will be surveying during the coming months will be common to all 3D packages and platforms.

Gary Yost, the creator of Autodesk's 3D Studio, once told me that he conducted his first experiments into 3D graphics on a Sinclair ZX81. That's like NASA saying it conducted its first experiments into orbital flying using a Frisbee. 3D graphics demands more advanced technology than any other computer application. The idea that you could generate them on a ZX81 is ridiculous.

But Yost has a taste for the ridiculous, and encouraged by his success at squeezing quarts of computing power out of the pint-sized Sinclair, he set about doing the same with the PC. The result, 3D Studio, was the first serious 3D modelling and animation package for DOS-based systems and, other than the Amiga-based Video Toaster (which relied on the Amiga's far more adventurous architecture), the only one capable of producing professional-grade computer graphics on cheap hardware. It had a quirky interface, mind-warping texture mapping facilities and configuration files written in Chinese — no-one could deny that. But it meant that a standard issue 486 could be used to model, animate and render quality work; perhaps not *Jurassic Park*, but certainly an ad for Now That's What I Call Music 25.

Affordable 3D

Having helped pioneer the territory, 3D Studio finds itself confronting competition from all quarters. And formidable competition it is, too: Caligari's Truespace (*Fig 1*), Macromedia's Extreme 3D, and NewTek's Lightwave (offspring of the original Video Toaster) are all capable of running under Windows 95 (which 3D Studio Release 4, the latest version, cannot). All are beginning to bring the cost of 3D to within the reach of semi-pro, and even amateur, animators and artists. Also, there is an emerging generation of really cheap tools — Ray Dream Studio, Visual Reality, Simply 3D, Instant 3D — which means that just about everyone can join in with the fun.

What's what in 3D

So where to begin? A good starting point might be to map out the increasingly complex 3D market and its likely development in terms of the tools available and the uses to which they are being put.

Right at the top is the equipment responsible for high-profile effects such as the dinosaurs in *Jurassic Park* and the saccharine spectre in *Casper* — the workstation-class packages from Alias/Wavefront and Softimage. Alias/Wavefront is now owned by Silicon Graphics, the company that produces the graphics workstations used to run this sort of software. Softimage has been taken over by Microsoft. Both are hugely expensive suites of software run on Unix boxes (though a Windows NT version of Softimage 3D version 3.0 has just been made available) and require a great deal of experience to use.

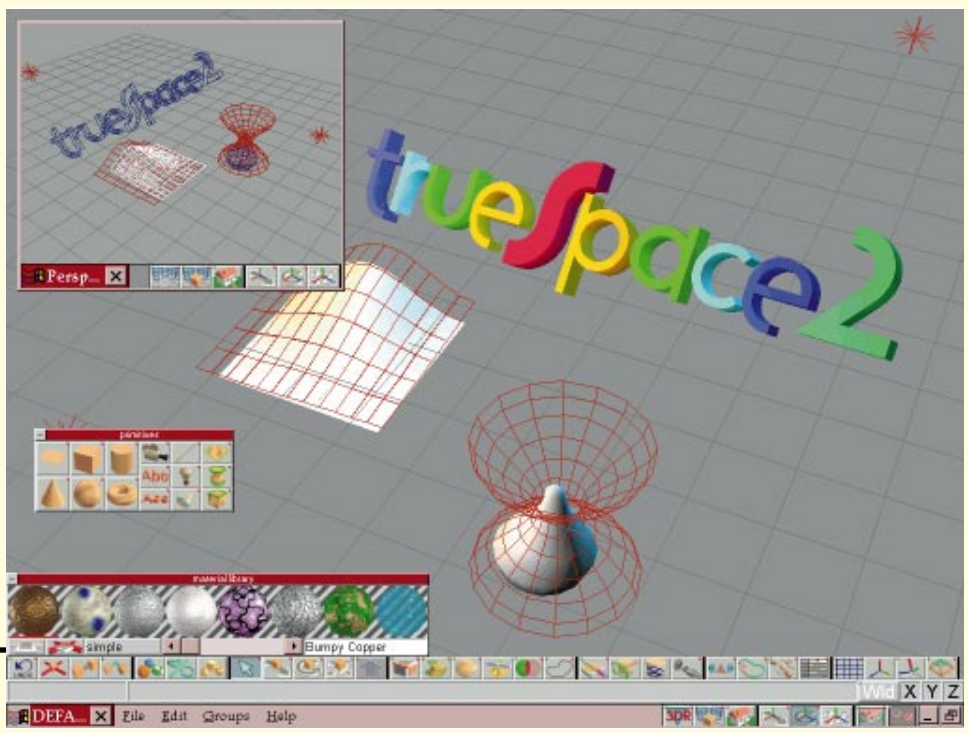

Fig 1 *Truespace 2 brings formidable 3D facilities to animators and artists*

Fig2 *Wall texture map*

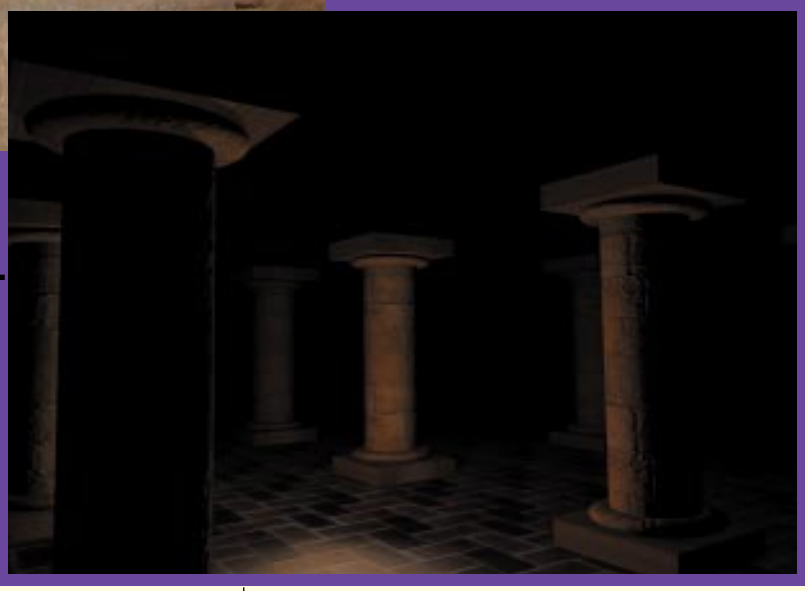

Fig 3 *A scene rendered using the wall texture map*

Lower down the scale we find 3D Studio. There are now two versions: Release 4, which runs under DOS, and the all-new MAX, which runs under NT. Autodesk is currently promising to "maintain and extend" Release 4, but its future must be questionable as DOS starts to disappear. A MAX upgrade has been available free with all purchases of Release 4 since the announcement of MAX last autumn, so there is little incentive to stick with DOS unless you are a glutton for user hostility.

Next rung down the cost ladder comes Lightwave, from Newtek. This is a package which, as mentioned above, has its origins in the extraordinary Amiga-based Video Toaster system and has attracted considerable kudos thanks to its use in series like *SeaQuest* and *Babylon 5*. This is something 3D Studio cannot yet boast, though it has been used in a couple of movies, *Johnny Mnemonic* and *Virtuosity*. It costs £695 and runs under Windows 95 as well as NT and the dear old Amiga; the company is loyal to its origins. It uses a "ray tracing" renderer, which produces fabulous results but makes huge demands on your hardware.

I have not used Lightwave myself but among users there is a general consensus that it is quirky, sometimes awkward and betrays signs of its age and origin, yet is extremely powerful for the price.

The first brand-new package on the 3D market appears at the £500 region. It is called Extreme 3D and comes from Macromedia, the company that made its name with the Director multimedia authoring package. It looks very easy to use and quite powerful, although so far I have only seen demos. I will be able to provide a fuller picture of what it's like to use in next month's column.

For over £100 less (street price around £370) you can get an ambitious and extremely tempting package called Truespace 2.0, from Caligari. This aims to bring the full 3D modelling and animation monty to the Windows 95 environment — a feat it pulls off if you confine yourself to manipulating relatively simple models. It is ideal for producing little .AVI files for use in presentations. Cheaper still is Visual Reality 2.0, which costs just £170. Like Truespace it tries to offer the lot, but as a result perhaps overreaches itself.

Visual Software, which produced Visual Reality, has come up with something far more interesting with Instant 3D; it doesn't bother to emulate a full authoring package but provides the facility for creating little 3D objects (typically logos) for dropping into OLE-compliant packages such as Word. It is fun to use (though it did crash a couple of times) and at just 30 or so quid could provide just about anyone with a tantalising taste of the allure of modelling.

This is by no means a comprehensive survey. New products seem to be appearing almost weekly, driven partly by the explosion of interest in VRML (Virtual Reality Modelling Language), the standard modelling language for the Internet — but more of this next month. Nevertheless, a clear picture is emerging of 3D as a mainstream application of PCs, and one that gives us exciting new ways of exercising the computer's creative potential.

Texture du jour

Textures are crucial to building convincing 3D models but creating or finding suitable ones isn't always easy. I hope to bring you interesting examples on a regular basis.

There is nothing particularly clever about the one in *Fig 2*, but it does reveal some of the basics of texture creation. It is based on a photograph of a wall of Chichester Cathedral. I had the film (standard 35mm) developed onto Photo-CD (which can now be carried out at a number of film development centres, including Boots) and I edited it using CorelPaint 4.0 — my least favourite bitmap editor but the one I bought.

Using "cloning", which allows you to copy one part of the picture to another, I have made the image "tileable". In other words, when it is applied to an object (say a column, as you can see in *Fig 3*) it forms a continuous pattern even though the same image is repeated over and over again along the length and height of the object.

The Memory Palace

I began building a virtual palace for a BBC2 programme called *The New Middle Ages*. It was, I think (and no-one has yet denied it) the first documentary to have been filmed using virtual sets throughout. It was a tough assignment completed for virtually

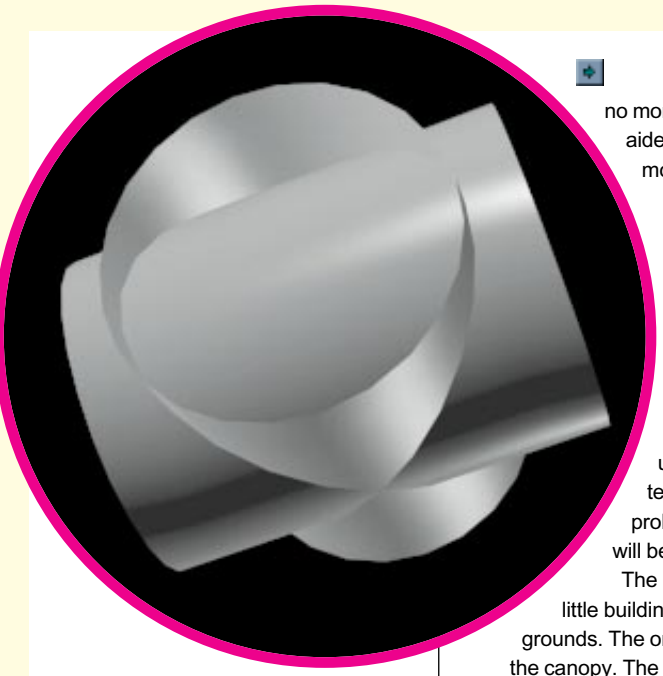

Fig 3 *Two cylinders at right angles before the boolean operation*

Fig 4 *And after...*

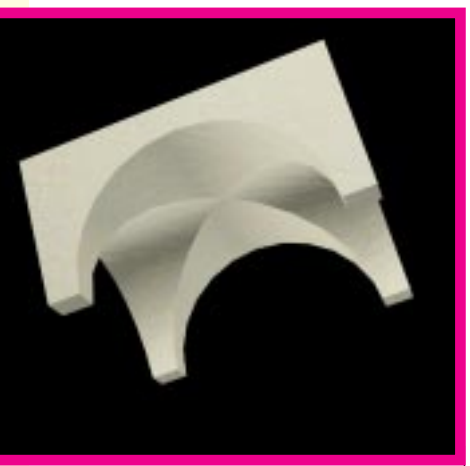

Fig 6 *The completed arch with basic texture applied*

no money, with hardly any time, but aided by my friends at the 3D modelling company, Modelbox.

I have decided to keep working on the "Memory Palace" (the reason for its name need not concern us here; suffice it to say that it refers to a medieval method of remembering stories). I hope to show the work in progress in this column and discuss some of the techniques involved and the problems encountered — there will be plenty to talk about.

The Palace comprises a series of little buildings scattered around its grounds. The one pictured in *Fig 4* is called the canopy. The roof is "decal" mapped using a detail from a picture by the early Renaissance painter, Giotto, as the texture.

Fig 5 *And sliced in half to create the interior of the arch*

The most difficult part to model was the arched roof, and in the end I used a Boolean operation. This is a process that allows you to build one object out of a selection of others; in this case, two cylinders formed into a cross. The trick to making Booleans work is to ensure that the component pieces have compatible geometry (for example, edges and corners should coincide wherever they can). In this case, I achieved it by cloning one cylinder from the other, turning it through an exact right angle, and making sure that the point where they cross was perfectly aligned (*Figs 5-8*).

PCW Contacts

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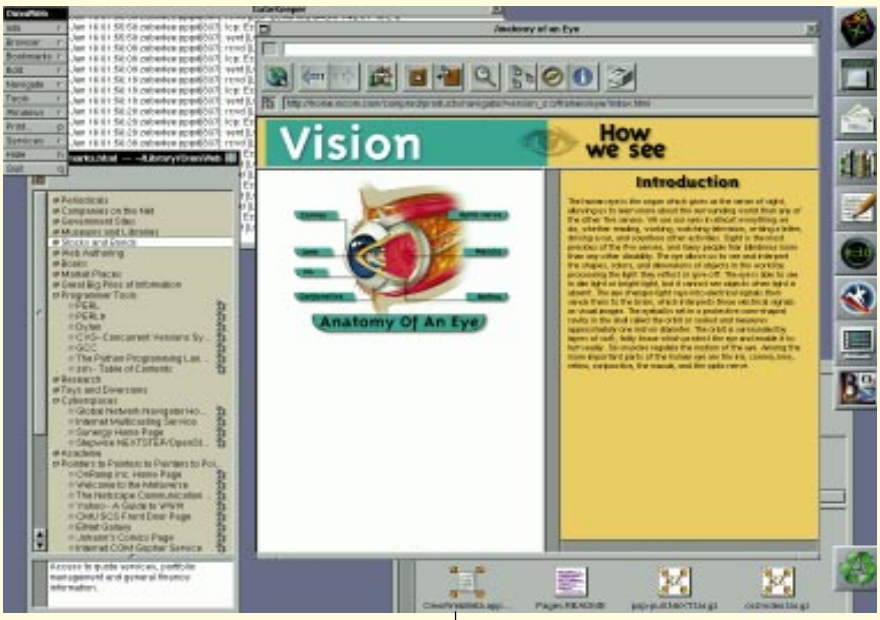
The **NeXT** wave

Chris Bidmead gives himself a PEP-up, suffers a bout of modem madness and loses his way in WebExplorer.

Paul Lynch, of P&L Systems, is the guru who has been helping me over the years with the NeXT side of my network, which is currently running a mixture of OS/2, AIX, NeXT, Windows 95, Windows NT, Linux and NeXTStep workstations. Regular readers will remember that it was Paul's outfit that came to the rescue last year when I managed to scramble my operating system on the Canon object.station. Paul is to NeXTStep what the Rover's Return is to Coronation Street — he's an indispensible adjunct to this column.

Paul came over to help me put a new NeXT machine on the network; an Intel-based racer from UK computer manufacturer, PEP. The company has joined with an outfit called "The Ledge", an indefinable entity that I've always thought of as a general fount of NeXTness; whereas Paul's operation, P&L, is a down-to-earth supplier of NeXT hardware, software and support,

The Ledge is more like an inexhaustible source of NeXT enthusiasm. It's run by ex-photojournalist and musician, Jackie Mackay, and is (loosely speaking) the computer research division of the information management association, ASLIB. It's also the HQ of NeXTStep Users UK (NUUK). The two strands come together because Jackie's prime role is as manager of the ASLIB Internet Programme, awakening people to the burgeoning opportunities of getting connected. Net browsing is something at which NeXT machines are particularly adept — in fact, the World Wide Web was born on a NeXT machine. But more on that in a moment.



The fully-featured OmniWeb browser for NeXTStep supports advanced NetScape bells and whistles like frames and backgrounds. The Bookmarks window on the left of the screen is an outline list of favourite sites — drag one onto the browser to make a visit

To my mind, NeXT really got started when it migrated to generic Intel hardware about three years ago and became more widely accessible. Since then, Jackie and NUUK have formed a good idea of what it takes to build a decent NeXT machine.

She says that in the past there's been a tendency to build down to a price, rather than pitch the hardware up to the level required by NeXTStep. It's a demanding operating system that isn't seen at its best when, for example, it's fighting against a so-so generic video card. So NUUK defined their ideal Intel NeXT box to PEP, and the result is called the I+ Machine, where "I" stands for Internet.

The 100MHz 486-based Canon object.station I've been using for the past year is no slouch, but the new PEP machine is noticeably faster, thanks to its 133MHz Pentium, and has the look and feel of a fully-fledged technical workstation. Jackie's sales pitch is that: "Unlike workstation manufacturers who use expensive proprietary parts, PEP PC used high quality but standard components, which means that they managed to deliver the machine at an excellent price."

The AIX machine I have here is mostly built on a similar philosophy (if you'll accept IBM's definition of the PowerPC processor as "standard"), and I'm impressed by the level of performance you can get from generic hardware these days. The I+ Machine is the first Triton chipset PCI bus machine I've had in the office and it's the first time I've come across a Number Nine Imagine video card. The combination makes for brilliantly fast graphics on the Iiyama MT9021E 21in monitor that PEP has supplied with the I+.

The machine's stereo sound system

uses a SoundBlaster AWE32 card, driving a pair of 80W Active Drive speakers. As an old fuddy-duddy whose definition of multimedia is reading a book with the radio on, I tip my hat to the possibilities opened up by properly equipped machines like the I+.

Modem madness

However, it took a while after the machine's arrival before I heard the awesome orchestral chords that announced the successful completion of the dialup Internet connection.

"Internet ready" out of the box this machine wasn't. I hit the screen button that was supposed to start the connection, and the machine just hung. The problem wasn't helped by the fact that the I+ Machine uses an internal modem with no visual indication of what's happening to your connection. I'm not a particular fan of flashing LEDs in a general way, but when you're diagnosing a modem they just can't be beaten. The modem wasn't making any sounds either, and because it was on COM2 with a serial mouse on COM1, I couldn't fit another modem without taking the machine to pieces. Which is just what we did when Paul arrived.

The internal modem proved to be the problem, and once we'd replaced it with a Hayes Optima 288 (an external modem with aggressive red flashing LEDs), Paul showed me how you can use the BSD utility "tip" to check out how the modem's doing.

BSD stands for Berkley Standard Distribution, a flavour of Unix distinct from the version by AT&T, the company whose Bell Laboratories gave birth to the operating system, which it liked to regard as being mainstream. Today's System V, the descendent of AT&T's Unix, has absorbed much of BSD, but some utilities such as "tip" remain distinctly Berklean. Linux draws heavily on System V, and none of the Linux distributions I have floating around here know anything about tip.

I won't go into the nitty-gritty of "tip" here, or into the other low-level Unixy tweaking we did to get NeXTStep to work with Demon, my Internet service provider.

The birth of the browser

The word "excited" is over-used in this business, particularly by marketing managers introducing the latest me-too product, but I must confess that using Nexus sent a shiver down my spine. It was the first-ever Web browser, written at the end of the eighties by the inventor of the World Wide Web. The fame of the US Mosaic browser in '93, spinning off the following year into NetScape, has obscured the fact that the WWW idea was put together on a NeXT machine at the CERN physics lab, by Oxford graduate Tim Berners-Lee.

Nexus was never intended to be more than a "proof of concept" implementation. The other browsers add bells and whistles and show off NeXT features, like drag and drop, to the full. I don't want to get into a features war between them, but a couple of things shine through loud and clear. Firstly, Web browsing is essentially a multitasking activity, so having a decent 32-bit operating system becomes important; and secondly, NetScape may dominate, but it's not the only browser, and it's not "the best". So Web sites that tie themselves to it with NetScape-only enhancements are gaining a few flashy features at the expense of the thing the Web is really all about — universality of access.

OmniWeb's wry comment about this on its Web page is a logo that mocks the ubiquitous "Enhanced for NetScape" tag. It says: "Not too shabby in OmniWeb 2.0", and the adjacent comment is: "When you see this icon you'll know the Web site you're visiting is using advanced HTML features such as tables, frames, background images, font control, progressive JPEGs, and others, but that the site isn't geared exclusively towards a certain monopoly. Feel free to use this icon on your pages if you tire of worshipping monopolies."

Berners-Lee's original Nexus uses plain NeXT windows for the browsers and standard NeXT screen furniture to build control windows like the Document Inspector. I wouldn't say it's the world's fastest browser, but it's certainly a tribute to what you can knock up in NeXT to no time with the Developer's Kit

Broadly, you need a SLIP or PPP driver to carry TCP/IP through the serial link, out to the modem. On top of this sits a control program that takes care of the dialling and activates the connection — in this case it's the freeware package, GateKeeper. Once GateKeeper had made the connection I found I had a choice of several NeXTStep Web browsers to play with, including Netsurfer, OmniWeb, SpiderWoman and Nexus.

OS/2 and the World Wide Web

Running multiple operating systems is hard work, but one of the compensations is that it certainly gives you an insight into the good, the bad and the ugly of the software offerings across all platforms. For instance, if I had nothing to compare it with, I'd say that Warp's WebExplorer is a pretty good browser, setting aside the unfortunate bug in the latest version 1.03 that drops out whole paragraphs when it's printing Web pages to a PostScript printer.

When it first came out, IBM's Internet Access Kit, bundled with Warp, was an eye-opener; to my mind the best ready-to-go way of getting full Internet access. WebExplorer wasn't quite finished in time for the launch of Warp, but you could download a decent workable Beta using the built-in Internet software update mechanism and get up and running in no time. If you take a look at http://www.ibm.com/Features/4guys.html you'll see the proud story entitled "Four Folks, Four Months, No Sleep", about how the WebExplorer was rushed together as soon as it dawned on IBM that Tim Berners-Lee's invention was opening up a not-to-be-missed strategic opportunity (four years after TBL had told the world about the World Wide Web, but at least a year ahead of Microsoft).

Bugs and stinkers

Well, okay, that's noble stuff. But what's happened since the first launch of Web Explorer? A few NetScape-inspired features have been added, some bugs killed, some new stinkers introduced. Thanks to OS/2's good underlying multithreaded architecture, WebExplorer runs nice and smoothly and much of it integrates well into the WorkPlace shell. You can drag a graphic from a Web page and drop it into a directory as an independent file, and you can similarly use drag'n'drop to store a URL, the Universal Resource Locator address that will allow you to call up the same page next time you log on. But, as becomes apparent when you compare WebExplorer with a properly thought-through browser like NetSurfer, or OmniWeb, some elementary stuff ignored in the initial rush to product remains unfixed a full year later.

IBM, do you copy?

Web browsers are tools for gathering information, much of it textual. One of the first things you expect to be able to do with text is copy and paste it between applications. So naturally in NetSurfer you can mark a block of text and copy it across to an editor or word processor. The same goes for OmniWeb, NetScape, and virtually every other browser. Except WebExplorer. The best you can do is call up the HTML source for the page into Warp's editor and copy from that, collecting a bunch of probably unwanted HTML codes in the process. Some months ago, we talked here about how you might use the Unix text processing language, awk, to tidy this up, but frankly you shouldn't have to.

Publishing limitations mean that this column is written a few weeks in advance of publication, so I hope my WebExplorer whinges will be overtaken by events and that IBM will have released an update, or a new browser, that takes care of my objections.

Your Letters

A while ago, *PCW* responded to the many requests we've had from readers by including a copy of the Linux Slackware distribution on our cover-mounted CD. I should say that I wasn't involved in this initiative,and I wouldn't have described it as "shareware" which, of course, no GNU software is. Check the terms of the GNU licence if you want to know more about this.

So a lot of you now have your own copy of this powerful 32-bit operating system. But there's no pleasing some people. A number of you have written to me to complain that it isn't the very latest version of Slackware.

● This correspondence is representative:

"On reading that the Slackware distribution of Linux was included on PCW*'s cover CD-ROM, I was extremely happy as I had been planning to purchase the LDR CD-ROM set. However, on discovering that it was version 2.0 of Slackware Pro, my heart sank. I can see no reason for not including version 3.0. Hopefully this 'oversight' will be corrected at a later date."*

Chris Bannister
cj@renegade.demon.co.uk

Steady on, Chris. I take the view that the Linux world isn't about keeping up with the latest releases. For instance, I'm happy with version 1.2.13 of the kernel; the "production version". Yes, there's an experimental, less stable, version 1.3x which is supplied as an option with Slackware 3.0 but for me there's a universe of stuff to explore on these slightly older implementations of Linux. I'm in no hurry to rush on to the latest version.

I concede that if you have Linux already, our cover-mounted CD wouldn't have been a great upgrade. But then, whatever you get off a CD anywhere is bound to be out of date in this fast-moving world. You should be tapping it directly off the Internet if you really want to keep up. And for people who haven't tried Linux yet, Slackware 2.0 is a great start to your journey. What you've got is a fully-fledged, enterprise-worthy, industrial-strength 32-bit operating system and development environment comparable with software that sells for four-figure sums. Get stuck in. And by the time you're ready to upgrade, Slackware 3.0 will probably be history anyway.

● Robert Collier writes to congratulate me on the column (thanks, Robert):

"…it is the first thing to be read in my copy of PCW *these days* (blush). *I've recently installed the time-limited demo of NT-Server from the cover of a magazine, and I have been pleasantly surprised (I rm -rf'd Windows months ago). It seems quite sane and stable compared to Windows. Now if only Microsoft would sell it at an affordable price."*

Robert Collier
rob@tanstafl.demon.co.uk

Well, free off a magazine cover isn't bad, except of course your Windows NT server will bomb out after 60 days. You may have read that applying the £2 Service Pack (read "bug fix"), downloadable from Microsoft's Web site (http://www.microsoft.com) defeats the time-out mechanism and gives you a full-featured version, except that it can't be a primary or backup domain server.

I have not investigated the legality of using this trick to extend the time you spend evaluating the software, so don't go telling Microsoft I said you could do it. But in my view, all these time-out tricks and nagware nuisances you get with proprietary software strengthen the argument for going down the GNU route.

PCW Contacts

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Mountain of **macros**

Tim Phillips **didn't have to go there — the mountain came to him. A mass of macros for your delight, plus tips on spell-checking and accents.**

There are several macros this month, so I'm limited for space to tell you about what is going on in the industry. One major development, though, is the distressing spread of the "macro virus" to Word Pro (formerly Ami Pro).

According to Andy Campbell, managing director of anti-virus software supplier Reflex Magnetics, the recently-discovered Green Stripe virus is the first to affect documents produced on any other word processor except Word.

To recap: a macro virus attaches itself to a word processor document as a macro stored with the document template. When it's opened, it attaches the macro to other documents it finds. What the macro actually does when it is opened, is the payload, which can potentially be quite destructive. The problem is that documents are commonly shared across networks.

Green Stripe is a classic example of this for Word Pro users. The price you pay is fairly innocuous — it changes all the "its" in your documents into "it's". Reflex picked up the source code in an underground magazine: no, we aren't going to tell you which one. You can spot it because you will find macros called InfectFile.smm (not very subtle, that) attached to your document — and because your files keep being opened and changed.

Reflex's anti-virus software, DiskNet, has a novel solution to the macro virus problem — it searches for auto-executing macros and warns you. Phone Reflex for more information (look at the *PCW* Contacts box for details).

If it's any consolation, at the rate Word for Windows sells these days, the Word Pro virus is limited by market forces — not, perhaps, a comforting thought for Word Pro users.

Internet assistants

Over the last few months I have had a few replies to my search for a good HTML editor. This is becoming increasingly important, and equally difficult to find. Many of you recommended HotDog, which I found far too complex for my tiny mind. My main horror is still the multiple searching and replacing needed for upkeep of a word processor document in HTML format.

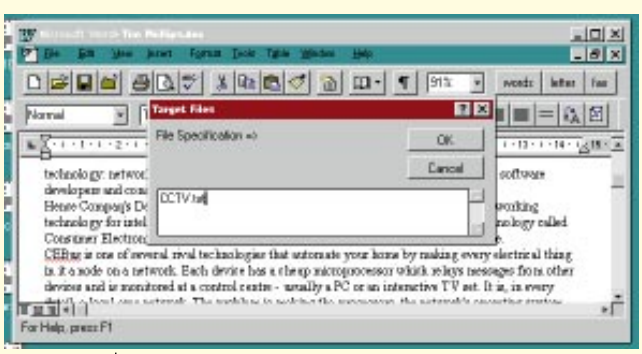
davcefai (*sic*), from sunworld.mt, offers a long but glorious search-and-replace macro by email (see *Fig 1*). The macro searches across directories and subdirectories. It has several uses, but I include it here because it is excellent for searching and replacing links across a collection of Web pages, so if you are struggling to maintain a whole set of documents, this is your macro. It's ideal for contracts and reports.

"The attached file, MACRO.TXT, is a Word 6.0 macro to perform a find and replace on an entire directory and its subdirectories," Mr davcefai explains. *"Basically this macro first reads the files into a file named PDIR.OUT, and then loads each of these files in turn in order to perform the find and replace operation… When you run the macro you are first asked for the filespec of the files to change. You are then asked for the top level directory from which to start searching."*

Now please mail me, Mr davcefai, to claim your prize, as I don't know where you live.

A similar shareware program can be found in ftp.demon.co.ukpub/ibmpc/win3/apps/wchange.

Called WinChange, it will handle GRP, INI, PIF and HTM files and works over a network. Thanks to David Agbamu, of Manchester, for the upload.



The global search-and-replace macro in action

Tim's Macro Club

Don't be shy of telling me if you haven't been rewarded for your macros yet and I declared you a winner in previous months. "A fair day's work for a fair day's pay" is what I say, and some of your efforts imply more than a day's work.

Please be aware that I can rarely print long macros because of space limitations. On the other hand, I've already included a long macro this month, because it's a good one. You'll just have to take care copying it out.

If you are online, you can mail me to

Fig 1 Search-and-replace macro

```
'-----------------------------------------------------------------
'       Declare Global Vars. Filespec$ is target files, path$ is the
'       target directory, tcnt is running total of files found
'-----------------------------------------------------------------
Dim Shared filespec$, path$, tcnt
Sub MAIN
        filespec$ = InputBox$("File Specification => ", "Target Files")
        Search                          ' Create a File List
        If tcnt < 1 Then
                x = MsgBox("Warning: No files found", "Warning", 0)
                Stop
        End If
'-----------------------------------
' Get the FIND and REPLACE strings
'-----------------------------------
        is$ = InputBox$("String to replace >", "Replacing")
        willbe$ = InputBox$("New String >", "Replacing")
'-------------------------------------------------
' Confirm operation as an error would be disastrous
'-------------------------------------------------
        x = MsgBox("Replacing " + is$ + " by " + willbe$ + " in " +
filespec$ + " (" + Str$(tcnt) + " files)", "Confirm", 1)
        If x <> - 1 Then Stop           ' User pressed CANCEL
'-----------------------------------------------------------------
' Now we open the text file with the list of files to operate on
' The first line of this file is the directory name so we read this
' into PTH$. The next lines are filenames
'-----------------------------------------------------------------
        Open "pdir.out" For Input As 1
        Input #1, pth$
'-------------------------------------------
' Sequentially open the files and do the job<None>
'-------------------------------------------
        While Not Eof(1)
                Input #1, fname$
                fto$ = fname$
                FileOpen .Name = fto$
                Doit(is$, willbe$)              ' Call Subroutine
                FileSave
                FileClose
        Wend
End Sub
'=====================================
' Subroutine to do the Find and Replace
'=====================================
Sub DoIt(is$, willbe$)
        EditReplace .Find = is$, .Replace = willbe$, .Direction = 0,
.MatchCase = 0, .WholeWord = 0, .PatternMatch = 0, .SoundsLike =
0, .ReplaceAll, .Format = 0, .Wrap = 1
End Sub
' ================================================
' These are the routines that create the file list in PDIR.OUT
' ================================================
```

CONTINUES OVER

request copies of macros if you can't get one to work. I might take a couple of days to reply to your messages though, as I'm deluged by your emails — the information superhighway has left me lying in a hole in the ground covered in tyre-marks.

My plea for macros that can use a counter, such as an invoice counter, prompted many interesting and well thought out macros. But all were for Word; so any other contributors with experience on other platforms will, as ever, win by default.

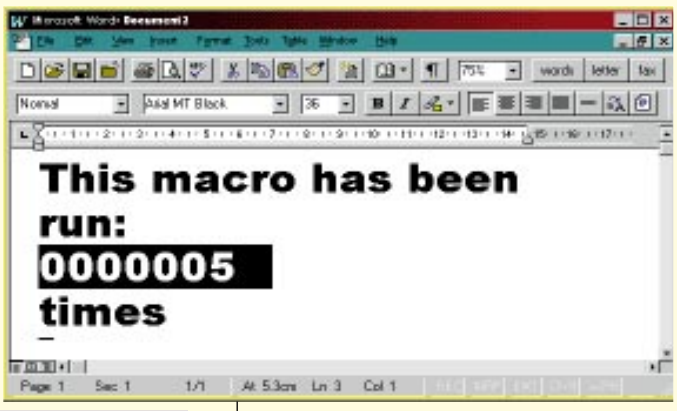
Fig 1 (continued)

```
'=======================================
' Search the directory for matching files
'=======================================
Sub Search
   path$ = InputBox$("Enter Directory > ")          ' Get Directory
   If Right$(path$, 1) <> "\" Then path$ = path$ + "\"
   Open "pdir.out" For Output As 1                  ' This is the file list
        Print #1, path$                  ' Write path to file
   listfiles(path$)              ' Call recursive subroutine
'        listdirs(path$)
   Close 1
' Close Output File
End Sub
'=============================================
' Recursive Subroutine to list the files in the directory
'=============================================
Sub listfiles(p$)
   Dim cnt
        Dim f$(100)             ' Wordbasic does not have a REDIM
PRESERVE
                ' Statement, hence the arbitrary number
        Dim i, fname$
   fname$ = Files$(p$ + filespec$)' Get first filename.
'---------------------------------------------
' Read all the files found into the array f$()
'---------------------------------------------
        While fname$ <> ""
                f$(cnt) = LCase$(fname$)
      cnt = cnt + 1                      ' Increment counter.
      fname$ = Files$()
   Wend
'---------------------------------
' Write the filenames to the file
'---------------------------------
        tcnt = tcnt + cnt       ' running total of found files
        cnt = cnt - 1
        For j = 0 To cnt
                Print #1, f$(j)
        Next
        listdirs(p$)
End Sub
'-----------------------------------------------------------------
   Get subdirectories in a directory. You need to first
get a count, then read each one. Don't blame me, there
is no DIR$ function in WordBasic!
'-----------------------------------------------------------------
Sub Listdirs(p$)
        x = CountDirectories(p$)
        For i = 1 To x
                d$ = GetDirectory$(p$, x)
                dpath$ = p$ + d$ + "\"
                listfiles(dpath$)       ' get the files
        Next
End Sub
```

● Most contributors used the solution outlined by Mark Heaton on the republic of Microsoft Network: *"By far the easiest way to tackle the problem is to store the last used invoice number in the INI file (or Registry) to do this function:*

`GetPrivateProfile$()`
and
`SetPrivateProfile$()`
are used. The AutoNew macro is called each time the template is opened, reads in the number of the last invoice and increments it.

The only task still remaining is to store the new number in the INI file. To do this, use the AutoClose macro and write the number only if it is greater than the existing number (this allows the invoice to be reopened at a later date without having to destroy the last number)."



The kludge macro for generating invoice numbers. It simply inserts the contents of a file at the insertion point. Not pretty, but quick

● Vital Debroey and Jacques Thoorens both mailed macros from Belgium, solving the problem in this fashion. M Debroey's macro code and explanation is shown in *Fig 2* (it was shorter).

Fig 2 Debroey's macro

1. In the template, insert a bookmark at the position where the invoice number will be inserted. Give it a name, say "InvoiceNumberGoesHere".
2. Add the following AutoNew macro to the template, or insert the lines between "Sub MAIN" and "End Sub" into the existing AutoNew macro:

```
Sub MAIN
  INIFile$ = "WINWORD6.INI"
  Section$ = "My Private Settings"
  ProfileString$ = "NextInvoice"
  BookmarkName$ = "InvoiceNumberGoesHere" 'this bookmark MUST exist!
  'get next invoice number (as a string) from the INI file
  NI$ = GetPrivateProfileString$(Section$, ProfileString$, INIFile$)
  'if nothing found, assume "1" as next number
  if NI$ = "" then NI$ = "1"
  'insert at the appropriate bookmark
  EditGoTo .Destination = BookmarkName$
  Insert NI$
 'save the next invoice number in the INI file
  NI$ = LTrim$(Str$(Val(NI$) + 1))
  SetPrivateProfileString Section$, ProfileString$, NI$, INIFile$
End Sub
```

Hints & Tips

Spell checking

A Mr or Ms aspiers (that's an email name) added to my discussion of spell checking in the last issue.

"A useful feature when using Microsoft applications is the spell checker. This can highlight unknown words and add them to a custom dictionary. This is normally called 'CUSTOM.DIC'. A problem can occur as each application can create its own CUSTOM.DIC, meaning that you have to teach each application your own variety of unusual words. The way around this is to point each application to the same dictionary. Edit WIN.INI using SYSEDIT, then amend the entries for the dictionaries under [MS Proofing Tools] to point to the same file."

Accent on WordPerfect

Mr P Kahrel saves the day for WordPerfect users with a routine to get accented characters by typing two-letter combinations as discussed in the hints section a couple of months ago: "You said that you felt a macro coming on to enter accented characters, and you were right. So here you are. Chris Collins' accent key is easily implemented in WordPerfect. Here is the macro:

```
CHAR( Accent ; "Accent: " )
Accent := NTOC( Accent )
CHAR( Letter ; "Letter: " + Accent )
Letter := NTOC( Letter )
SWITCH( Accent+Letter )
  CASEOF "ga" : Type( "" )
  CASEOF "ge" : Type( "" )
  CASEOF "gi" : Type( "" )
  CASEOF "go" : Type( "" )
  CASEOF "gu" : Type( "" )
  CASEOF "gy" : Type( "" )
  CASEOF "aa" : Type( "" )
//more combinations...
ENDSWITCH
```

"In the commands Type(" ") the relevant WP characters need to be inserted. To enter the a-grave in WP, press Ctrl+A and type `a in the Compose window. The e-grave; Ctrl+A `e.

"To assign this macro to a hot-key, let's say the Insert key is in the separate coloured key island, save the macro in the WP macro directory (as, say, ACCENT.WPM) and edit the keyboard so that the Insert key calls the ACCENT macro. Shift+F1, 4, 3 brings you to the Keyboard edit screen. There choose Create, press the Insert key in the Key field (WP inserts "en Ins" for enhanced Insert key), then choose 5 and press Enter to create the macro.

"In the macro edit screen type CHAIN("ACCENT.WPM") and press F7 until you are back at the edit screen. To try the macro: press the Insert key and type ga. If all is well, the a-grave should be printed on the screen. (You can also enter the whole macro in the macro edit screen, rather than calling it from disk, but the method described here makes it easier to change the macro.)"

Note that he uses a section called "My Private Settings" in WINWORD6.INI, which will be created the first time the macro runs. You can use this macro technique for all kinds of settings that need to be inserted into new documents.

Fig 3 Using a dummy file

```
Sub MAIN
f$="c:\invoice.num"
a=1
On Error Resume Next
Open f$ For Input As #1
Read #1, a
        Close
        a$=Str$(a)
a$=String$(8-Lan(a$),
"0")+Right$(a$, (Len(a$) - 1)
Insert a$
a=a+1
Open f$ For Output As #1
        Write #1, a
Close
End Sub
```

● A less elegant but nevertheless effective solution, from Rob West in Cheshire, uses a dummy file called "invoice.num" in the root directory. (See *Fig 3.*)

Jason Whyte agrees with this approach and suggests a refinement:

"It's not the most elegant way of doing things, but it does work. Perhaps a better, and much more useful way of doing things would be to have a file with a table of numbers, filenames and other useful information on the document. When creating a new invoice, Phil could have a dialogue to get the desired filename and info, then read the control file to get the last number and add a new row for the new invoice. That way, he not only numbers each one automatically, but builds an index document for them."

Comments on both of the above, please — and maybe you could look at problem number two, below.

● This month, I have a couple of simpler problems, suggested by Alison Walley at the American University of Beirut:

1. *"Converting the 'new document' button to bring up a list of templates, instead of one based on the normal template. In Word 2, which I still use on my trusty Dell 486P/50, I reconfigured the standard button as FileNew instead of FileNewDefault. Is there any way of doing the equivalent in Word 6, because I can't seem to find one?*

"My solution up to now has been to design a new button altogether, which seems a bit of an effort. Also, why does the Word 7 Ctrl+N command always bring up a blank document? It should bring up the list of templates.

2. *"I want to print A5 brochures. It's possible to get these the right size by setting page orientation to landscape and putting the document into two columns. The problem is the page numbers.*

"WordPerfect v6 (for DOS anyway, and I suppose for Windows) had an option to print brochures like this which actually sorted out the pages in the right order for printing. I rather hoped Microsoft would put something like it in Word 7.

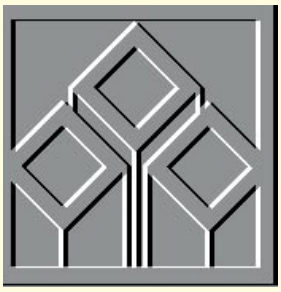
"It could be done with a counter of some sort set at the left and right margins of each page, but how do I get such a counter? I see that someone else (in your February issue) asked about counters for a Word 6 macro, so hopefully someone will produce some ideas for this."

Printing an A5 booklet using landscape orientation and two columns. Any improvements on this for a more professional job?

PCW Contacts

Contact **Tim Phillips** by surface or airmail to **PCW**, otherwise email him at **wong@cix.compulink.co.uk** and **CompuServe 100436,3616**

Reflex 0171 372 6666



A **bed** for the **night**

Stephen Wells **examines a solution for calculating student bed nights, puts error reporting into apple pie order, and springs up with a custom-designed dialogue box.**

You've probably played the party game "Chinese Whispers" where half a dozen people sit on chairs in the middle of a room and the first person tells the second a short story. The second then tells the third and so on, along the line. Everyone is amused by how much the story changes: the fifth version is quite different from the first — and often better.

Chinese whispers

A similar sort of thing to this game happens in our forum within these pages: in the January issue, I passed on an Excel User Defined Function for calculating occupied bed days in a hospital (sent in to me by Neil Bain). However, he wrote it in VBA (Visual Basic for Applications) and I translated it into an Excel 4 macro because that can be used by Excel 4, 5 and 7 users. In fact, there is even an "MS Excel 4.0 Macro" option on the Excel 7 Insert, Macro menu.

This motivated Dave Parry to email me, saying that they've been calculating bed nights for students in residence at Imperial College for so many years that they devised their formula in Lotus 1-2-3 1A!

From the brief description Dave has provided, I've recreated his solution in 1-2-3 Release 4 for Windows. A typical result is shown in *Fig 1*: Column A shows the date the student moved in; column B, the date they moved out; C1, D1 etc, are named Month1, Month2 and so on. See the formula in *Fig 2*.

You always need one more column of formulas than your highest date. In this example, we need column J. There are the same formulas in it although I've hidden the column in the display.

Dave says that it only works when the Ep(isode)Start >=EpEnd but nobody's going to leave before they've arrived, so I don't see that as a problem.

Also, it is assumed that the end date is actually the morning after the day the student vacates the bed. You can easily drop that extra day by having the Month2, for example, as Month2 - 1.

Fig 2

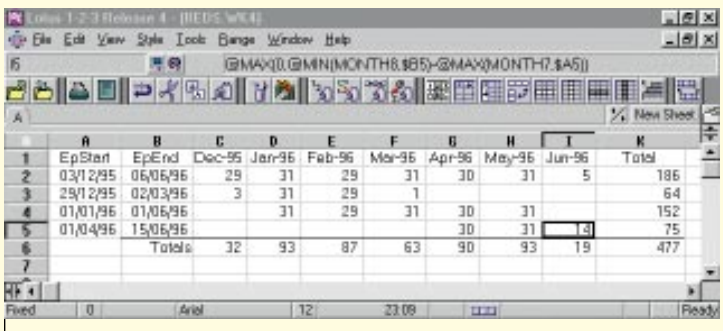
The basic formula is in cell C2:

```
@MAX(0,@MIN(Month2,$B2)-@MAX(Month1,$A2))
```

This is then replicated across the worksheet

```
D2= @MAX(0,@MIN(MONTH3,$B2)-@MAX(Month2,$A2))
and C3= @MAX(0,@MIN(Month2,$B3)-@MAX(Month1,$A3))
and D3= @MAX(0,@MIN(MONTH3,$B3)-@MAX(Month2,$A3))
```

and so on.



	A	B	C	D	E	F	G	H	I	K
1	EpStart	EpEnd	Dec-95	Jan-96	Feb-96	Mar-96	Apr-96	May-96	Jun-96	Total
2	03/12/95	06/06/96	29	31	29	31	30	31	5	186
3	29/12/95	02/03/96	3	31	29	1				64
4	01/01/96	01/06/96		31	29	31	30	31		152
5	01/04/96	15/06/96					30	31		75
6		Totals	32	93	87	63	90	93	19	477
7										

Fig 1 *Calculating student bed nights in residence, using Lotus 1-2-3 R4*

Dave points out that: *"The interesting thing is the different approach to the problem. We were thinking graphically and used the MIN and MAX functions to discard the nights outside the period in question."*

I would add a couple of comments. If you have a solution that has stood the test of time for you, there is no point in changing it. However, creating a function (as previously shown in the hospital example) uses far less memory. So if the version of your spreadsheet allows you to custom-design a function and you expect to have a large worksheet, then you'd be better off following that road.

If you're counting, Dave provided version three. Then I received this email from Len Harvey: *"Great article in this month's mag (January). Can you provide the Visual Basic module for the Bed Sheet Days Function?"*

So I thought I'd offer Dave's solution, written as a VBA macro which creates an Excel function. The EpStart and EpEnd date input ranges have been renamed Start and Ends respectively.

Creating the function in Excel 7 is automatic once you've entered the macro to your workbook. To do that just choose Insert, Macro, Module and enter the

Fig 3

```
Function Beddays(Start, Ends, Month1, Month2)
          Dim Start As Date
          Dim Ends As Date
          Dim Month1 As Date
          Dim Month2 As Date
    ActiveCell.Formula = _
      "=MAX(0,MIN(Month2,Ends)-MAX(Month1,Start)"
     End Function
```

details shown in *Fig 3*.

When you return to your worksheet, you select the first cell where it's needed then choose Insert, Function, User Defined, and then the new function, Beddays.

If the macro finds the Names on your worksheet, it will use them automatically. Otherwise it will run the Function Wizard and ask you to insert data or the cell where the data can be found.

Other readers will recognise that this method of dividing up periodic events across a calendar has many more applications than for slumbering patients, students or hotel guests. If you adapt it for planning staff holidays, recording sunny days, or part-timers' schedules, let me know. I look forward to seeing version five.

Quick tip

Incidentally, if you ever get stuck while you're writing a VBA macro in Excel 7, here's a tip which is worth the price of this magazine and more.

Click the place in the macro where you want to insert the new code. Then choose Tools, Record Macro, Mark Position For Recording.

Click the tab for your worksheet. If the Visual Basic toolbar is not showing, right click on the standard toolbar, then select Visual Basic.

Go to the starting cell. On this Tools menu, choose Record Macro, Record At Mark. Then, using the keyboard (not the mouse) do what you want the macro to do. To finish, click the button with a black square on the VB toolbar (Stop Macro).

Now click the Module 1 tab (or whatever you've renamed it) and you'll find Excel has written the code for you. Bless you, Bill!

To err is...

And so to a question about error reporting from Nick van Terheyden who emailed me from the Saudi Arabian office of a "Big Eight" international accounting firm:

"I have a largish spreadsheet that picks up a figure and places it in a column based on the title of the column. This is for dividing expenses into different categories.

"The formula is:

```
=IF($H6=J$4,$D6,"")
```

"My difficulty is that the worksheet is too wide to fit on the screen so I cannot always see if the amount is put into a column. I want to add a validation column that shows an asterisk, or something, if I enter an invalid code. This would save scrolling across to check whether the amount has been categorised correctly. The best I have done is:

```
=IF(ISERROR(LOOKUP(H6,Valid_Values_
Dec95)),"*","")
```

"But this only reports an error if you enter a number. Any text, and it leaves the cell blank."

With Excel 4 and better, you have a number of options. First, instead of

```
=IF($H6=J$4,$D6,"")
```

if you use

```
=IF($H6=J$4,$D6,ERROR)
```

then when your cell with ISERROR in it

EXCELlent shortcuts and longshots

● **Watermarks.** Like to have a watermark behind your worksheet printouts? You can with Excel 7. Drag aside a small block of your worksheet. Click the Drawing button to display the Drawing Toolbar. On this, click the Text Box button. Drag on your worksheet to produce a box the size of the block. Replace the original cell contents. Outside your worksheet area, produce a duplicate-sized Text Box. Inside, type text (such as CONFIDENTIAL, or your name) or insert a picture (such as your company logo).

To format just the text, select it and a Font dialogue box only will appear. If you select the whole Text Box, the Format dialogue will offer five tabs including Font and Patterns. If your printer doesn't recognise colours, such as a light grey, you can format the type as white and the box in a light pattern.

● **Macro Buttons.** It's easy to produce a new button on any Excel 7 toolbar which will run the macro of your choice. First, right-click on any toolbar, then choose Customize. Drop down the Categories of toolbars to Custom. Drag the blank button (or any design you like) out of this box and onto any toolbar in your workspace. An Assign Macro dialogue box will then appear with the available macros listed. Click the macro you want to assign to this button. Then close the Customize dialogue box.

Now, whenever you click that button, your macro will run.

Down the wire

Having signed on with the Microsoft Network (MSN) I discovered that the Microsoft Exchange options, to request a receipt when a message is delivered (and also when read), currently only work with a correspondent who is on MSN. Then again, it would appear that emails with attached files won't cross networks, although heaven knows I initially received enough of them (uninvited) from MSN sales people.

One day there will be greater compatibility. In the meantime, I was contemplating how I could distribute my templates down the wire. What I needed was to find someone who is interested in financial analysis and who is also on MSN.

Then out of the blue came an email from John Woollam. The name may mean little to you now. But, believe me, when the history of this column is written John will feature as a major contributor to its progress. If I could aspire to the roll of that great journalist, Sir Henry Morton Stanley, then John would be David Livingstone.

His first email read: "*Is it possible, please, to send me by email the Excel spreadsheet templates for service companies and those that carry stock? This is the first time I've found someone in the mags using MSN.*"

I sent him the templates. He emailed them back so I could open them and check that everything was okay. Then we embarked on an orgy of file exchanges: in colour, sound, photos, fancy-formatting, spreadsheets, charts, and more. Apart from font files, every file extension there has arrived in working order, just like it does with my cc:Mail Mobile entry to the *PCW* office network.

So the moral is: if you're on MSN and you want to send or receive spreadsheets, just send me an email. And think of John.

Fig 4 *(right) The comprehensive Excel help screen for creating dialogue boxes*

looks at that formula it will give you your " * " response, whether the error is caused by a number or text.

Also, there are a lot more IS functions to choose from including ISTEXT, ISNONTEXT, ISNUMBER, ISERR (which refers to any error except #N/A) and ISNA (which refers only to #N/A). You can also stack these IS functions in multiple IF statements to get what you need.

Another solution would be to use the ERROR.TYPE function. This returns a number corresponding to one of Microsoft Excel's error values.

A #NULL! Error would return a 1; #DIV/0! 2; #VALUE! 3; #REF! 4; #NAME? 5; #NUM! 6; and #N/A 7.

If you Name the appropriate cell, you can have a macro run automatically which might give you a tailored error message or take some other action. If you called the cell Account, and the macro Fixit, then you would use the following formula:

```
IF(ERROR.TYPE(Account)=6,Fixit)
```

The formula checks the cell named Account to see if it contains a #NUM! error value. If it does, the macro named Fixit is run.

Neat trick

For those readers who wish to go the other way and hide error values, here's a neat trick. Change the font colour of the cell that contains the formula to white (assuming your background colour is white). Then go back and assign a custom numeric format to the cell. Choose, Format, Cells, Custom, and type

```
[Black]General
```

in the Type box. The first action hides all entries. The second action displays entries other than error values. I know this seems odd, but it works in Excel 4, 5 and 7.

If your worksheet is more than a screenful, you can also instantly zoom out to view many more columns. In Excel 4, there are Zoom In and Zoom Out buttons on the Utility Toolbar. In Excel 7 there is a Zoom Control box, which offers several percentages, on the Standard Toolbar.

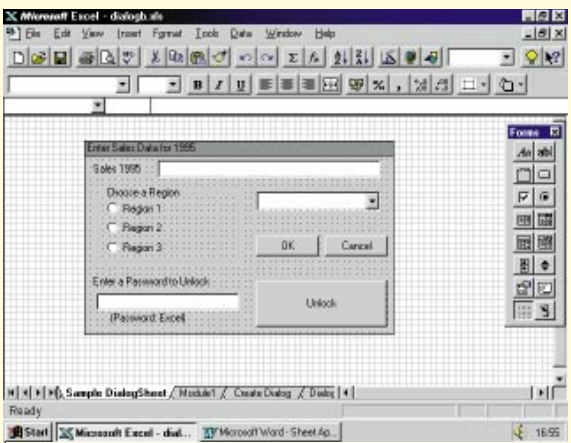


Fig 5 *The template for a dialogue box created by the Create Dialog macro*

Dialogue boxes

To add your data, you may find it more convenient to have a custom-designed dialogue box.

There are several ways of creating one, offered in Excel 7. For the first, choose Help, Index. Type "dialogue box", then pick "Creating custom". This offers the screen, shown in *Fig 4,* which you can click in five different places to open boxes of explanations.

Alternatively you can choose Insert, Macro, Dialogue and be offered a template with an OK and Cancel button in place and the Forms toolbar ready for inserting labels, buttons, list boxes, scroll bars and so on.

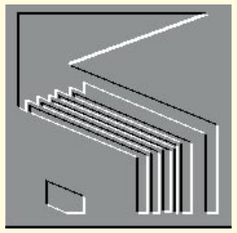
An even easier method would be to open up the file called Samples.xls, which should be in the C:\Msoffice\Excel\Examples directory, and copy the listing for the CreateDialog() macro. Then, in your workbook choose Insert, Macro, Module and paste it in. To run this macro, merely click within the listing and then press F5.

It will create a more complete template (*Fig 5*) than the previous option, on a sheet with a tab titled "Sample DialogSheet". You can either modify it graphically there, or change the text back in the listing which will be automatically added on another new sheet in the workbook with a tab titled Module 1.

If you haven't yet started a new workbook, you can also run this macro by opening the Samples.xls file and then choosing Tools, Macro. You'll find CreateDialog among the 30 listed available macros.

PCW Contacts

Stephen Wells welcomes comments on spreadsheets and solutions to be shared. Send them to *PCW* Editorial at the usual address or
Stephen_Wells@msn.com
Files can be attached if you are on MSN.



Bad **behaviour**

The strange behaviour of FoxPro 2.6a under Windows has not gone unnoticed by concerned developers. Mark Whitehorn offers a forum for complaints, and some sympathy.

There appears to be growing concern among FoxPro developers about the behaviour of FPW 2.6a under Windows 95.

The following arrived from Matthew Cook-McQueen:

"I've been wondering about your opinion of Microsoft's treatment of developers. As you are probably aware, there are some problems with running FPW 2.6a under Windows 95.

"The following ones give a flavour and are explained further in a document available from the Microsoft Software Library; the file name is FW_WIN95.EXE.

1. The FoxPro icon is displayed in the Explorer for a distributed application, even if the developer has included another icon.
2. The FoxPro 2.6 icon is displayed in the Title Bar and Task Bar.
3. The FoxPro 2.6 icon is displayed periodically in a screen's Title Bar.
4. The Close menu does not work.

"Microsoft say this about the close button problem —

'Under Windows 95, commands available on the system menu are also accessible through icons on the right of the title bar. Icons are greyed if the command is disabled to correspond to greyed options on the system menu. The Close icon is always disabled for FoxPro 2.6, regardless of whether Close is enabled.

'Developers can exit FoxPro 2.6 via the Close option on the System menu, using the Exit option on the File menu, or by typing Quit in the Command Window. Users of FoxPro 2.6 applications can use the Close option on the System menu or methods such as a Quit option included in the application.'

5. Screens with a BorderType of System, Panel, or Double cannot be restored after being minimised.

"Microsoft say:

'A screen which is defined as to have a BorderStyle of System, Panel, or Double cannot be restored once the user minimises it under Windows 95. To work around this problem, change the BorderStyle to None or Single or disable the minimise option.'

"Microsoft appears unwilling to issue a maintenance release (2.6b?). At the same time, it is unreasonable to expect all applications to be converted to Visual FoxPro in order to get round these problems. Kevin McNeish (CompuServe 74504,3723) has been organising a petition on CompuServe regarding these problems, the hope being that Microsoft will eventually issue a bug-fix. He provided the following:

'There have been a few other problems, the most serious being memory leaks. Apparently, if you continually run a screen with picture radio buttons it exhausts system resources.'"

I contacted Microsoft about this and the official line is:

"We are continuing to sell FoxPro 2.6 for Windows against the usual software industry policy to stop selling a version of a product when the newest version is released.

"As in all development efforts, we have limited development resources available. Releasing a patch to 2.6 for Windows, which isn't even the most current version of the product, would significantly impact the development schedule for our future FoxPro products like Visual FoxPro for Macintosh 3.0, and future Visual FoxPro for Windows products. Hence we opted to post solutions for the five most common areas of interest to help customers work around these issues."

My sympathies lie firmly with Matthew on this one. If Windows 95 is a new OS, then products to run under it (like Visual Fox) are new products, not "newest versions". If Windows 95 is simply an upgrade of Windows 3.x, then old versions of software (especially those from the company which makes the OS!) ought to run, or at worst be patched until they do.

The electricity meter problem

Last month I described a problem which a colleague and I encountered. It involved matching records for electricity meter readings with the records containing the previous reading from the same meter. I said at the time that we had produced an SQL solution which worked fine but was flawed in terms of the SQL model. In other words, we cheated.

The cheat is hidden in that manipulation of the Counter field. Our solution involved ensuring that the records were in a particular order and numbering them. The number assigned to each record was then incremented by one as the records were copied to another table. Finally, the records in the two tables were joined on those numbers. Described like this, the cheat is clearer; effectively we were using the counter field to find for each record the one above it, which, as with our original solution, offends the relational model.

The solution we have devised is fine in terms of functionality; it works wonderfully and is currently in use. However, as I said at the time, we suspect there is something fundamental we are missing here. There must be a more elegant solution. Any ideas?

Speed glorious speed

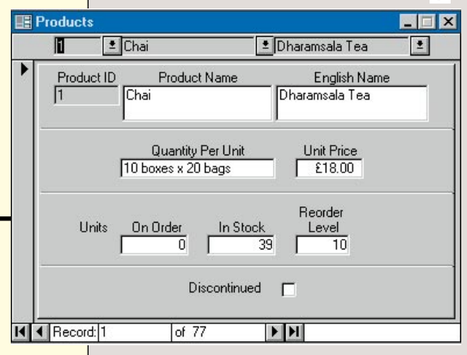
Over the last few issues the topic has been speeding up your databases. First we looked at query optimisation. The take home message was that your RDBMS should have a query optimiser which will look after optimisation for you in single queries. If you build a series of queries,

Synchronised combo-boxing — no nose clamp required

In the January issue of *PCW* I included a code fragment from John S Graham. He had identified a problem with combo boxes. He wrote: "If the combo displays a value and the user moves to a different record (using the form navigation buttons), the value in the combo remains static and does not follow the form. My code corrects this so that the combo 'follows the form'."

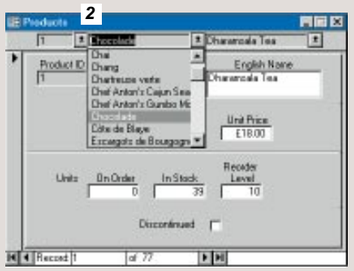
Tony Wall replied: "The example code appeared to be a little convoluted which prompted me to send in the following example" which is on the cover disk as CBODEMO.MDB. I'm not sure about the relative complexity. I suspect that hard-line coders will prefer John's solution while GUI users will prefer Tony's. Either is excellent if it solves a problem in the easiest way.

1

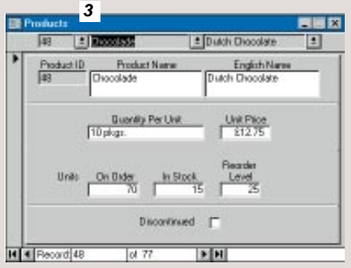


(1) Tony Wall's sample database CBDEMO.MDB. This single table list 77 products, complete with details

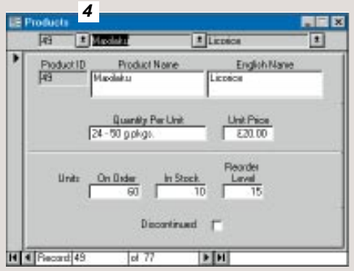
2



3



4



(2) The combo boxes along the top of the form list in numerical or alphabetical order the contents of three fields in all 77 records. By popping down one of the lists and selecting an item, the form will automatically jump to that record

(3) and the other combo boxes update

(4) In addition, if you use the record navigation keys at the bottom of the form to move to the next record, the combo boxes automatically update as well

each based on the previous one, make sure they work in a sensible order — sensible in this case meaning "optimised for speed".

Next on the agenda for examination for possible speed improvements was the size of the tables and the way the data is disposed between them. Normalising the data is the best strategy if the data in the tables is subject to continual update and addition. When the data is static and only queried, then normalisation may be a mistake. Putting all the data into one table which contains redundant information and is heavily indexed may give a better response time.

It is, of course, quite possible to find that you have both requirements (rapid update and rapid querying) in the same database. You can resolve these conflicting requirements by splitting the database. Leave a fully normalised database for data entry and update, but clone it every night, via one or more queries, to form a single, highly indexed table which can then be used for querying. True, the queries will all yield answers that are one day out of date, but for many queries this is immaterial.

Clearly there are a variety of factors you can balance here — how often you rebuild the mega-table (one a night, once a week, etc), choosing which queries can be run against the mega-table and which should be run against the normalised tables. As in any balancing act, trial and error (or "trial by error" as a friend of mine calls it) together with common sense will serve you well.

Table 1

Table	Records
Post Codes	80,000
Customers	8,000
Orders	12,500
Order Details	51,000
Items	200

Finally, possibly the most important factor in speed considerations — indexing. I realise that I will be teaching many of my grandmothers by covering this, but remember that statistic in the January issue: "about 70 percent of those databases had no indexing whatsoever (presumably apart from the Primary keys)". It implies that only 30 percent of readers can ignore this section with the contented feeling of a job well done.

Given a set of tables like those shown in *Fig 5*, and the associated query, we would normally expect the tables to have primary keys and other indices. Purely in the interests of science, I have removed all indices. The tables' sizes are in *Table 1*.

I timed the query with no indices and then added the significant indices to each table, reading left to right, re-timing the query after each table was modified. *(Table 2.)*

Tips & Tricks: Postcodes

Discussion on input masks for postcodes and phone numbers appeared several times last year. I recently received the following information from John Douglas re. the current and future formats of postcodes.

The current PostCode is composed of two subfields, Outward and Inward. This is soon to extended by a third subfield, the Delivery Point Suffix (DPS).

	---- Length ----			
Generic field	**Min**	**Max**	**Input Mask**	**Note**
Outward postcode	2	4	>LAaa	uppercase
Inward postcode	3	3	>OLL	uppercase
Delivery Point Suffix	2	2	>OL	uppercase

Source: Royal Mail Postal Address Book 95-96, About Addresses and Postcodes Customer Barcoding Trial Report & Technical Specification, Issue 2 March 1994

Summary notes

UK Postcode Format

```
Example:
        Current  PO1 3AX  max. width 4 + space + 3 = 8
        Future           PO1 3AX 1F       max. width 4 + space + 3 + space
                +2  = 11
```

Elements

1. Outward Code
   a) Area PO
   b) District 1

2. Inward Code
   a) Sector 3
   b) Unit AX

3. Delivery Point Suffix
   a) DPS 1F

Outward Code

The Outward Code is the first part of the Postcode. This is divided into two parts, the first part being letters which define the Postcode Areas. These letters are derived from the letters of a city, town or district in the area.

The second part of the Outward Code being a number and possible letter. These refer to the District within a Postcode Area. This number can be one or two digits.

Possible Formats Example

```
        ANA             PO1
        AAN             BN1
        AANN            SE11
        AANA            SW1A
        AN              L7
        ANN             E17
        AAA             don't know of an example
(A=alphabetic A..Z, N=numeric 0..9)

Access Input Mask:      >LAaa

Current combinations
        Postcode Area           approx. 130
        Postcode District(Area + District) approx. 3,000
```

Postcodes (continued)

Inward Code

The Inward Code is the second part of the Postcode. This is divided into two parts, the first part being a single-digit number defining the Sector within a Postcode District.

The second part of the Inward Code being two letters. These refer to the Unit within a Postcode Sector.

Format

```
        NAA             Access Input Mask:      >OLL

Current combinations
        Postcode Sector  (Area + District + Sector) approx. 10,000
        Postcode Unit    (Area + District + Sector + Unit) approx. 2
                Million
```

Delivery Point Suffix

The Delivery Point Suffix is the third part of the extended Postcode, this being a single-digit number and one letter. These refer to the Delivery Point within a Postcode Unit.

Format

```
        NA              Access Input Mask:      >OL

Restrictions
        digits   not 0    1..9 only
        letters  excluding C, I, K, M, O and V

Possible combinations:    9 x 20 = 180
Required combinations:    100

Current combinations:
        Delivery Point   (Area + District + Sector + Unit + DPS)
                                 approx.  25M
```

Did you know the format was due to change? Will your software be able to cope when it does? Perhaps in the future there will be more consultation between organisations which decide formats like these and the increasingly large user-community that has to handle their "standards" electronically. In addition, *porcine avians* may soon be commonplace.

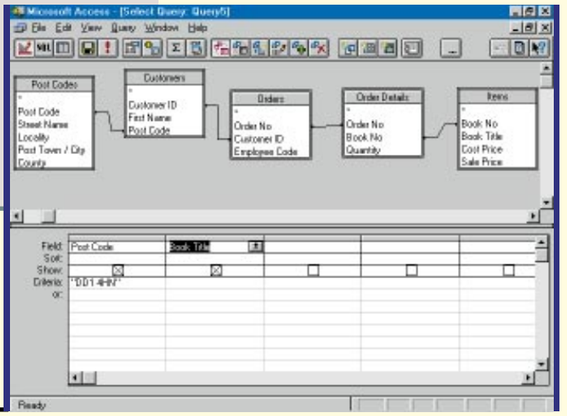


Fig 5 *The tables and query used for the indexing tests*

Table 2

Table with new indices in seconds	Fields indexed	Time for query
None	None	47
POST CODES	[Post Code]	12
CUSTOMERS	[Post Code]	8
ORDERS	[Customer ID]	6
ORDER DETAILS	[Order No]	1
ITEMS	[Book No]	< 1

The important point here is that you need to index fields which will be searched. In this case, that clearly includes fields like POST CODES.[Post Code] since we know that it will be searched for the value "DD1 4HN". However, fields like CUSTOMERS.[Post Code] also have to be indexed because the query will have to find the relevant records in the CUSTOMER table by searching that field.

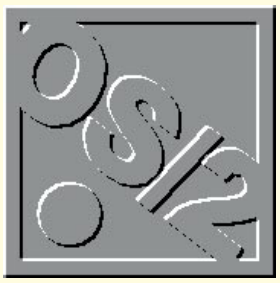
In fact, in a database like this, fields like CUSTOMER.[Customer ID] and ORDERS.[Order No] are typically indexed because they would be primary keys. However, in this query they are not searched and therefore indexing them should have no effect. Just to prove the point, I ran the test again with just these two fields indexed and the result was exactly the same as if no indices had been set — 47 seconds.

This is not meant to imply that I think primary key indices are irrelevant; quite the reverse. Most databases have multiple queries run against them rather than the one shown here, and primary keys are the most likely fields to be searched. However, primary keys will be indexed anyway, so which other fields should you set to be indexed? The obvious answer is every field which is a foreign key (that is, it is the other end of a join from a primary key). In addition, you should index every field that you know will be searched — fields like LastName, Telephone No. etc.

As you can see from the tables, indexing makes a huge difference. ■

PCW Contact

Mark Whitehorn welcomes readers' correspondence and ideas for the Databases column. He's on **m.whitehorn@dundee.ac.uk**



The **Eagle** has landed…

… and the year is looking good for OS/2 Warpers. **Terence Green** comments on a range of goodies, and looks forward to the appearance of some really useful Internet products.

This year is beginning to look good for OS/2 Warp users: Warp Server should be shipping by the time this article appears. Warp II (codenamed Merlin) is about to go into Beta. Lotus has started shipping the InterNotes Server version 2.0 which now runs on OS/2, and Lotus SmartSuite for OS/2 should soon enter Beta test too.

And then there's the Internet. If 1995 was the year that the World Wide Web was hyped to death, 1996 looks like the year that the really useful Internet products start to appear. Thanks to Microsoft's recognition, in December, of the importance of the Internet (when Bill Gates threw out the four-month-old Windows 95/Microsoft Network strategy in favour of a more "open" approach) almost everyone now sings from the same songbook.

This doesn't mean an end to standards arguments in the near future. There is already a plethora of proposals for commercially secure Internet services, for 3D VRML www browsers, and for additional HTML extensions. It does mean, however, that network client software will take on the look and feel of a Web browser, while Web servers will increasingly be targeted at internal and inter-company publishing applications via private and secure networks, as well as the wider and wilder Internet.

IBM is well-positioned in this respect, with several Web server and client tools already shipping, not least the Lotus InterNotes server which is now in its second generation. InterNotes Version 1.0 ran only on Windows NT, but InterNotes 2.0 (which will be bundled with Notes Release 4.0) runs on OS/2 and Unix servers as well.

Much of the attraction of a Notes Web server is in the security provided by its user authentication and data encryption, as well as in the multitude of tools available for the Notes platform. But there's more: at the end of December, Lotus introduced a Notes Mail client at £38 per licence and reduced the licence for the Notes Desktop runtime to £47. Both Notes clients can access the World Wide Web through a Notes Release 4.0 server running the InterNotes Web Publisher, and the new price for a single processor server is now just £341.

Of course, Lotus Notes Release 4.0 doesn't only run on OS/2; it also works with Windows, Macintosh and Unix systems and this level of multi-platform availability is apparently where IBM's application server line, currently codenamed Eagle, is heading.

Solving common problems

● NE2000 network adaptors

There's a known problem with the NE2000 Ethernet card, in some configurations, which will prevent the Warp Connect installation utility from completing. Sometimes this can be worked around by switching the computer power off, waiting ten seconds, and then turning it on again, which should reset the network adaptor card.

If this doesn't work, you will need to edit the CONFIG.SYS file on the second of the two installation diskettes — the one labelled Installation Diskette 1.

Add the following line to CONFIG.SYS making sure that it is the first BASEDEV statement;

```
BASEDEV=RESERVE.SYS /IO:xxx,20
```

(where "xxx" is the port address of the NE2000 adaptor). You also need to copy RESERVE.SYS from the OS/2 Installation Diskette to Diskette 1.

● IDE hard disk drives greater than 528Mb

OS/2 Warp recognises IDE drives with more than 1,024 physical cylinders if they are supported by the PC BIOS, or via a BIOS translation utility such as Ontrack or EZdisk.

If this is not the case, you must ensure that all FAT partitions and any bootable partitions (FAT or HPFS) are completely contained within the first 528Mb of the physical disk.

● Sound cards

There may be problems running sound in OS/2 and Windows sessions. By default, OS/2 does not allow sounds to be activated in both. You can enable sounds for both by remarking out a line in the CONFIG.SYS, but beware that this configuration is not supported by IBM, as unpredictable events may occur.

To enable sounds to be used in both OS/2 and Win-OS/2 sessions, comment out the line that refers to AUDIOVDD.SYS. The line is

```
DEVICE=D:\MMOS2\AUDIOVDD.SYS XXXXX1$
```

where D: refers to the drive and XXXXX will be something like SB16 or PAS16, depending on your sound card.

● Web Explorer

If you're having problems with a rapidly growing swapfile while using Web Explorer, and you're using a 256-colour video driver, try adding the -p parameter to the command line that invokes Web Explorer. Also, close down Web Explorer and have a look in the subdirectory \TCPIP\TMP. If it is full of numbered GIFs and HTMs and JPGs, delete them all.

This problem occurs when Web Explorer is started using LINKUP.EXE. This is the default setup. When you click on the icon to start Web Explorer it actually starts LINKUP which invokes the SLIP/PPP Dialer before starting Web Explorer. When started in this way, Web Explorer fails to clean up the \TCPIP\TMP subdirectory of temporarily cached files.

New products

Microrim R:Base 5.5

Microrim was demonstrating R:Base 5.5 at Comdex. R:Base was the first OS/2 database (even before Borland Paradox). At one time it was even in Microsoft's portfolio but it was handed back to Microrim when Microsoft fell for Sybase, the forerunner of SQL Server. The big news is that R:Base 5.5 at last has a graphical user interface. Look for http://www.microrim.com

IBM NetComber Internet Suite (Beta) for OS/2 Warp

Yet another Internet Suite. This one is designed for people who find Internet applications hard to set up and use, but the Beta looks like it needs a bit more work yet and it's a tad heavy on memory too. It relies a lot on Web Explorer (WE) components, so if you're already successful with WE you may not want to bother with NetComber which includes WWW, Mail, News, ftp, Chat and Telnet. You can download it from http://www.raleigh.ibm.com/ncr if you can get on to the server. From the UK it is usually easier to access busy servers in the morning before the USA wakes up.

IBM VisualAge for the Web

Based on VisualAge (IBM's object-orientated application development tool), VisualAge for the Web will enable developers to create applications, particularly database applications, based on the Web's HTML and CGI standards. Plug-ins supporting SQL and Cobol wrappers will allow VisualAge for the Web applications to access both legacy and relational databases.

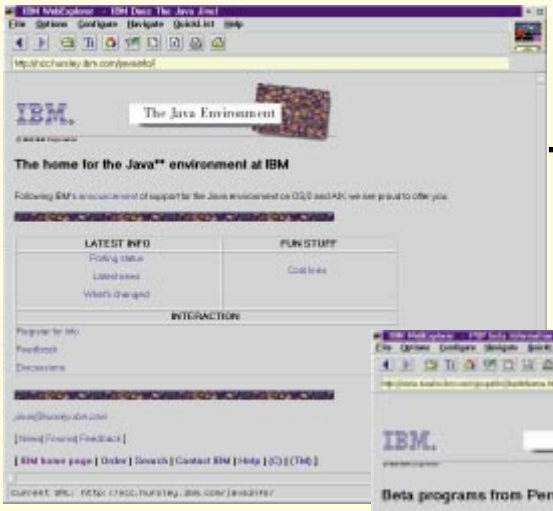
Seven up

Eagle is IBM's codename for a modular system comprising seven server applications: database, directory and security, transaction, communications, groupware, systems management, and Internet. The groupware server will be based on Lotus Notes. The Internet Connection server is already available, with a security-enabled Web Explorer for commercial work (announced last December).

Initially the aim is to offer Eagle on Warp Server and AIX, but other Unix versions and Windows NT are also likely platform candidates under IBM's Open Blueprint design framework. This aims to create a coherent product line from the mess of similar products which have been spawned in IBM's many autonomous hardware and software divisions. The idea is to make it easier to select a server application by removing the operating system and hardware platform from the equation. If it all comes together, it will be an effective antidote to the Microsoft and Novell one-size-fits-all Windows NT and NetWare server platforms.

Where Eagle is most likely to come together first however is on Warp Server, the merged LAN Server and OS/2 Warp

WarpServer brings Warp and LAN Server together in one box at last



The home for Java development is right here in the UK, at IBM's Hursley laboratory

Keep up to date with Warp beta programs through the Austin WorldWide Web site, or check on CompuServe (GO PSPBETA)

network operating system. The Eagle directory and security module, based on the OSF Distributed Computing Environment (DCE) and the Communications Server, are now out as Betas on Warp Server. The Warp Server base should just about be shipping in the UK by the time you read this.

Warp Server is expected to ship in Workgroup and Enterprise versions with the latter version having greater capacity and some Eagle components — for example, the Communications and DCE Directory & Security services modules. The workgroup edition includes file and print services, systems management, remote access, backup and recovery and advanced print services.

The Beta programme for Warp Server, which should have ended in mid-December last year, was effectively extended into January 1996 with the shipment of Warp Server Beta 2, also called the Gamma version. What this means is that the product is feature-complete, but IBM wanted a little more time to tidy it up before sending it to manufacturing. It almost certainly means that users will have to wait for Merlin (the next major Warp revision — Warp 96) for the new improved high-performance file system (HPFS), new local security and new Warp SMP (symmetric multiprocessor) support, but this column is ever-prepared to be overtaken by events.

Information on current Betas

If you want to keep up to date with the various OS/2 Beta programmes from IBM as they pop up, have a look at http://www.austin.ibm.com/pspinfo/betahome.html.

Several of the products mentioned above are detailed at this location, and additional products, including those from Lotus, are being added to this relatively new site. A complete 32-bit Lotus SmartSuite for OS/2, that will be feature-compatible with SmartSuite 96 for Windows 95, is just waiting on the completion of a 32-bit Lotus 1-2-3; a Beta may well appear shortly.

One of the more interesting developments in recent months has been the sudden acceptance of Sun's Java scripting language (which everyone rushed to license in the dying days of 1995). The work on incorporating Java into IBM products is being carried out at IBM's Hursley laboratories right here in the UK. Go to http://ncc.hursley.ibm.com/javainfo for up-to-date news.

PCW Contacts

Terence Green can be contacted either by post c/o *PCW*, or by email to **tgreen@cix.compulink.co.uk**
Updates and fixes other than FixPacks are to be found on CompuServe (OS2SUPPO)
ftp://ftp.software.ibm.com and **http://www.ibm.com**
Microrim 0800 6286990
IBM 01705 492222

Layout and think of the screen

DTP packages excel when it comes to layout processes, says Gordon Laing. You could be Web publishing on-screen, too.

Elsewhere in this issue (page 82) you'll find our annual group test of desktop publishing software, ranging from the budget to the high-end products. There's no reason not to join in with the DTP extravaganza: go forth and purchase… never been a better time to buy… and so on. But why should you bother? What exactly can you do with DTP?

The obvious answer is publishing on the desktop but have you ever stopped to wonder what this means? According to the dictionary, publishing is to divulge, to announce, to put forth and offer for sale any article such as a book or newspaper.

A desktop publishing application won't write, or correct your words, or make your pictures — let alone print, distribute and sell the final product. But it will considerably ease the other processes; primarily, those involving layout.

No more poisoned pen

Before computerised desktop publishing, layout involved taking individual metal type characters and arranging them one by one to make up the story. Strips of lead were fitted between rows of type to separate them, hence the term "leading" (pronounced ledding).

Other techniques involved manually cutting out and pasting pictures and type, almost in the manner of a poison pen letter. In either case, if you wanted to change something, to fit or cut the copy, you had to physically rearrange the elements.

Surely the computer could make this easier? Following initial dabblings on proprietary systems, desktop publishing — laying out pages on desktop PCs — arrived in the mid-to-late eighties.

To be perfectly accurate, Paul Brainerd, President and CEO of the company then known as Aldus, coined the term "desktop publishing" for the company's pioneering Macintosh layout product, PageMaker.

PageMaker, along with PostScript, and sophisticated digital type from Adobe, as well as Apple's easy-to-use operating system, set the Macintosh up as the graphics platform of the future.

Several versions of PageMaker later, newcomer Quark took the high-end DTP lead with XPress, and the battle for supremacy — and more importantly, the standard — has been raging ever since.

Both products, along with many others, are now available for Windows on the PC platform; indeed, current versions of the two heavyweights are cross-platform compatible and pretty much identical.

Adobe and Aldus merged some time ago, forming a graphics giant. Times change but one thing is for certain: electronic page-layout on desktop computers is here to stay.

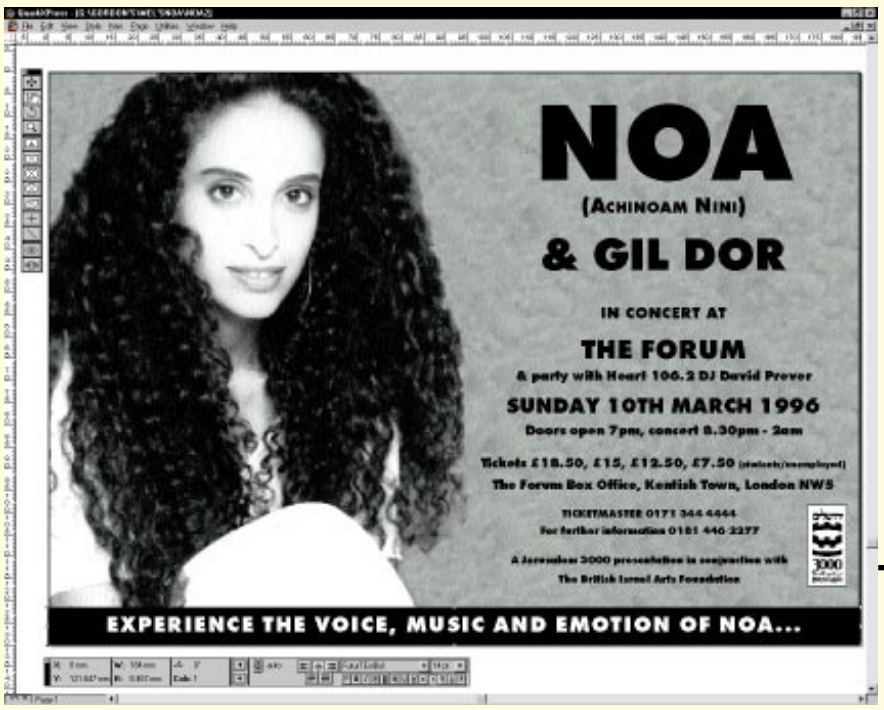
The best thing about DTP is the ability to move matter around with great ease and speed: if you think that picture would look better over there, move it. Want something bigger or smaller? Adjust it to your heart's content.

It's a wrap

Best of all are the often sophisticated text wraps around other objects, allowing you to easily adjust the other elements until the text fits the available space.

Designers of the old school might argue that this haphazard approach results in rushed layouts without any thought or planning. When you are physically pasting elements or setting metal type, there's no messing about. You have a good, long, think about the design before the tools come out, and usually come pretty close to what you're after, first time around.

My advice to DTP users is to always plan your more complex, or important, layouts on paper before ploughing ahead with carefree abandon. But it's good to know you can bang out quickies if you



Left is an advert I designed for a music event, featuring a Photoshop retouched portrait and background, overlayed with type placed in Quark XPress

need to, and that mistakes aren't the end of the world.

DTP or WP?

So DTP is literally layout on a computer; but do you really need a dedicated DTP application to produce your work? The answer is often no, since many word processors offer enough facilities to do the desired job.

Most WP packages these days allow you to create multiple columns and place pictures with basic text runaround. You generally get a fair degree of typographic control, too. If you're producing a modest brochure, booklet or newsletter, chances are that a competent word processor would fit the bill.

As your designs and aspirations develop, however, you'll yearn for the ultimate control which only a dedicated DTP application can offer. Once you've precisely adjusted the spacing between lines of text, or even the characters themselves, you'll never want to go back.

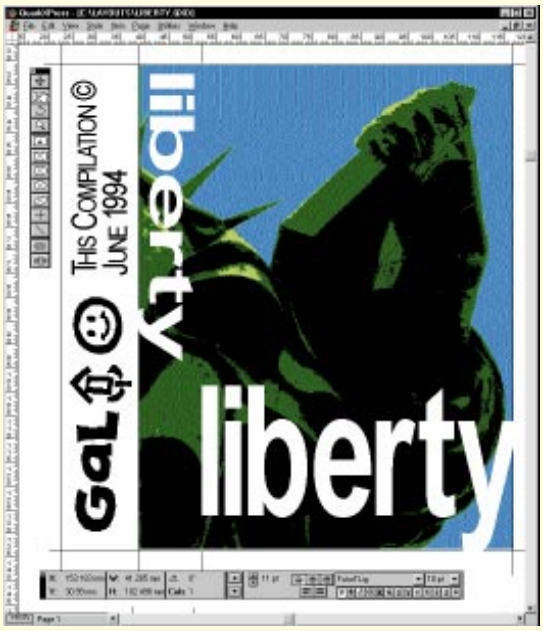
Then there's printing. Outputting on your local laser or inkjet may be fine for some purposes, but if you want to produce colour separations then you'll need something a bit more sophisticated. The basic differences between a WP with simple layout facilities and a proper DTP application are control, advanced facilities and an interface designed specifically for the job.

DIY DTP

Once you've decided what tool you're going to use, the question "What can I do with it?" springs to mind. Perhaps the most obvious use for DTP is on a regular publication such as a newsletter, magazine or newspaper. This is an area where DTP excels — you can set up templates just waiting to be flooded with text in the right places.

Last month I looked at ways of setting up lists of regular text styles and libraries of often-used elements, which along with templates considerably ease the layout process on a regular title. These features also allow you to maintain consistency within a publication.

Although most DTP applications offer excellent facilities for navigating multi-page documents, a great deal of layout is performed on a single page. Posters, invitations and greetings cards are all common single-page projects to which DTP's tools are ideally suited; there's also the consideration that most word processors cannot create documents much larger than A4. Tightening up letter and line spacing is particularly important for the large type sizes commonly found in such single-page documents.



This is what I do with my DTP package (Quark XPress for Windows 3.32). Above is a cassette inlay, featuring a photo I took on holiday. Directly below, a CD inlay, featuring a load of textures I shamelessly took from an Autodesk CD. Below, the second spread of January's Graphics & DTP, featuring someone else's far superior work

A happy event

The next time you throw a party, host a family event or change your address, how about designing the announcement or invitation with your DTP package? I *would* also mention designing your own greetings cards, but some live in fear that I will reproduce my now infamous Christmas card image in these hallowed pages *(surely not — Ed)*.

There's no need to stop at posters and cards: labels and inlays are ideal DTP-fodder. Why not make up a template for cassette or CD inlays? Or how about a set of templates to cover all the labelling areas of a video cassette. Properly designed and printed labels look great on tapes and allow you to make the most of limited space without the need to write around manufacturers' logos and model numbers.

Incidentally, you could try to emulate the typestyles on logos if you want to maintain the branding. After a little experimentation, I discovered that Sony is written in a style not entirely dissimilar to horizontally-stretched Times — try between 150 and 200 percent wider than normal.

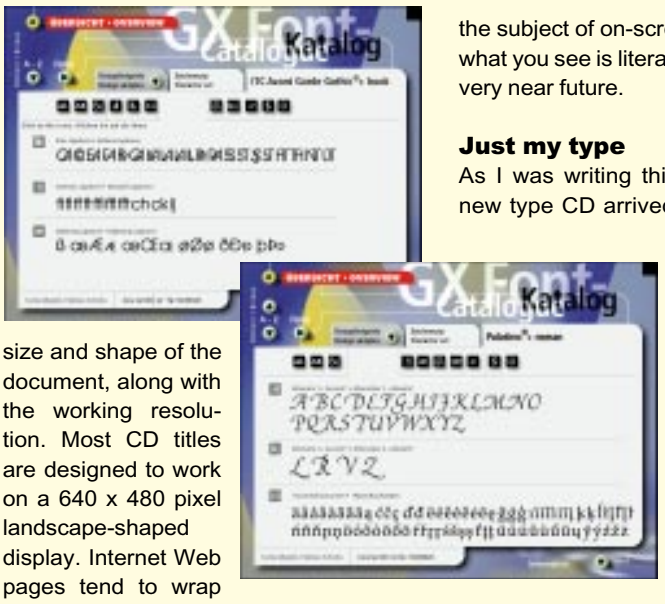
On-screen publishing

While DTP will continue to be used for paper-based projects, the future will feature an increasing number designed to remain on-screen. The two main areas are CD-ROM and Internet Web publishing. Designing and creating layouts specifically for on-screen use requires a few additional tools and considerations but otherwise most of the principles are the same. Technical considerations include the

Font of the Month

Baskerville Old Face

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abçdéfghijklmnöpqrstuvwxyzß&1234567890



size and shape of the document, along with the working resolution. Most CD titles are designed to work on a 640 x 480 pixel landscape-shaped display. Internet Web pages tend to wrap lines of text up to the border of the windows and scroll downwards until the document ends. In the manner of fitting to a fixed-size background they are subsequently not always masterpieces of design.

An important technical consideration of Web design is the time it takes to download the page or access the information. Great big colourful pictures may be wonderful for other projects, but they'll only slow a Web site down.

Any on-screen project also has a resolution consideration: since the document is viewed on the screen, there's no need for picture resolution to be any higher than that of the display (normally 72dpi). Then there's small type, which at 72dpi may be illegible. This is where anti-aliasing techniques come into their own. They increase apparent resolution by strategically placing dots of a colour and shade intermediate to the background and foreground, around the outline. Black text on a white background would feature grey dots in the steps between one row of pixels and another; when viewed at a distance, the result is much easier to read.

Hands On Graphics and DTP will cover the subject of on-screen publishing, where what you see is literally what you get, in the very near future.

Just my type

As I was writing this month's column, a new type CD arrived: Fonts Just in Time 6.0 from Linotype-Hell. It comprises the entire Linotype, Berthold Exclusives and Elsner & Flake libraries; that's over 3,900 fonts. In fact, there are so many of them that the original, mixed PC/Macintosh disc of version 5.0 has been abandoned in favour of a disc for each platform.

Along with the fonts there's a variety of utilities, including a fabulous one for the Mac which demonstrates QuickDraw GX fonts. The disc is free to Linotype-Hell hardware users, or £5 to everyone else. As a taster, Linotype-Hell has unlocked 12 typefaces for free. My favourite is the classic, Baskerville Old Face, which was the obvious choice for Font of the Month (above).

Baskerville Old Face is credited to Edmund Fry in 1768, although the original Baskerville Book was designed by John Baskerville 11 years earlier. It would be interesting to see what these designers would make of today's technology, and whether they'd bother with products like Fontographer.

PCW Contacts

I'd love to hear your graphics-related tips, tricks or suggestions. Write to me at the *PCW* address on Broadwick Street or email me as **gordon_laing@pcw.ccmail.compuserve.com**

Linotype-Hell Fontshop 01242 285100
Faces 01276 38888
FontWorks 0171 490 5390

A **brighter** light

Panicos Georghiades and Gabriel Jacobs switch on to a new version of Illuminatus 3.0, the cheap and easy authoring program. There's an upgrade to Multimedia Toolbook, too.

Last month we mentioned the release of a new Windows 95 and OS/2 version of IconAuthor. Now it's the turn of that other mainstream multimedia authoring package for which so many people seem to be opting, Asymetrix Multimedia Toolbook, which is about to come out in version 4.

Multimedia Toolbook 4.0 (for Windows 3.1 and Windows 95) should be available by the time you read this. In the meantime we've been scrutinising the spec, and it really does look interesting.

For a start, the new version has a redesigned structure offering extensible plug-in architecture which allows users quick access to the specific functionality they need. For example, you can now use standard Visual Basic Controls and HTML (Internet) interfaces.

A new Book Specialist automates authoring tasks by making the user answer a series of simple questions, while a palette optimiser automatically adjusts colours to create a unified colour scheme. It is worth noting, as well, that a script remover protects your code, so that end-users cannot pinch bits of it from distribution versions of applications (something which rightly worries many developers).

A special CBT (Computer Based Training) edition will also be available. This includes an enhanced course management system with a bookmarking function that tracks down a student's progress. And there are CBT Specialists (similar to Book Specialists, above) which speed development by enabling an instructor to create an entire CBT application framework by answering a series of questions. There are over 200 pre-scripted drag-and-drop widgets, too, that automatically add interactivity and test student comprehension of the material.

For both products, Asymetrix claims a 50 percent increase in runtime performance — that will certainly be an important step forward, if it's true. We'll be testing the products as soon as we get our hands on them.

The new standard version will cost £800 (a drop of £200) and the CBT Edition will be £1,050.

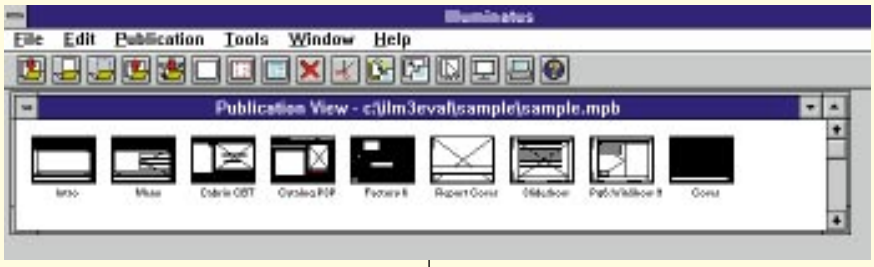
Sample pages illustrate the publications you can create with Illuminatus 3.0

The programs, accessories and games available in Illuminatus 3.0

Illuminatus 3.0

Last month, we mentioned the release of Illuminatus 3.0. This is one of the cheapest and easiest multimedia authoring programs around — which is why we've decided to give it a bit more space here, to describe what it does and how it works. We're also including a demo version of it on the cover CD, so install it and see for yourself.

Illuminatus, which has been around now for three years, offers three main advantages over other products: speed of production, price and ease of use. It's also a very flexible program, enabling you to produce a wide variety of applications such as electronic brochures, newsletters,



An overview of sample pages available in the Illuminatus multimedia application

disk-based catalogues and online books, as well as rolling demos for use in shop windows.

It supports most media available for delivering information on a modern PC. These can be text, still images (a wide variety of formats), animation, sound, music and video. The latest version supports MPEG video and PhotoCD images.

The simplicity and ease of use comes from the fact that there is no programming involved; there isn't even an attached scripting language. To create an application, you first prepare your material (text, pictures, movies, and so on) then import it into pre-drawn screen layouts in Illuminatus.

Although you can design and draw the individual screens that make up the pages in your application, the program provides hundreds of ready-made templates, some of which are even assembled into empty "books", ready for you to fill with your own data. There's also a good collection of clip media for your use.

Each of the templates contains a number of frames into which you place images, text or other multimedia objects. By double clicking on any object, you can set or edit its properties by filling in a dialogue box with the appropriate details about that object.

You basically work with these frames. You first import, say, a video clip or a bitmapped still image into a frame. You then use check boxes to select various options about how you want it to be displayed. For instance, you can scale it to

Questions & Answers

● I wish to set up an interactive multimedia database able to provide text, JPEG and MPEG images. Ultimately, the database is to live on the Internet. I want to be able to provide a copy of the database on a CD on a monthly basis.

Do you know of any applications which may address this scenario? Additionally, if you are aware of any good books which address this area, I would be glad to hear of them.

James Khan
jkhan@pncl.co.uk

You don't provide enough information for us to really narrow down our answer, but the question is one which will interest a number of readers.

Many multimedia authoring programs provide database support. But do you have an existing database file (such as one created in Access or dBase) which has to be accessed by a multimedia application you'll be writing, or do you intend to manage the database through the multimedia authoring software?

Anyway, since you'll be distributing this on a CD every month, we assume that it's a read-only type database — that is, the users will not be required to add any data themselves.

Our advice is to create and manage the data in a standard database application: Access, Paradox, Superbase… whatever you're familiar with and suits you best. Then use the multimedia application only to access its data. This gives you maximum flexibility with regard to the programs you use (your data may be used by many different programs). What's more, your data will be in a format that may have a longer shelf-life.

Most multimedia authoring packages enable you to access database files. Some do this directly, some via ODBC, and almost all can access data tables in ASCII format. All databases enable you to export their data to ASCII files.

So accessing database data is not a real problem. You could run into complications, however, if your database is a relational one; in other words, if the data is spread among a number of files and records related to each other through common data keys. In this case, using single ASCII-based tables (files) will be slow if your files are large, and linking them together will be difficult. If you have a relational database, you will have to access database files in their native format.

If this is the case, not all multimedia authoring packages can do the job. Some,

Continued on page 313

Questions & Answers (continued)

such as Authorware, Multimedia MasterClass and IconAuthor, can work via ODBC, while packages such as Toolbook and Director require external modules. Asymetrix sells a database connection module for £200, which enables Multimedia Toolbook to access external databases. Third party software exists for Director.

As for putting this up on the Internet, we don't envisage major problems, but it will mean a lot of work.

Of course, Internet access ought to be the same as any other kind of access. As a matter of fact, one of us has just set up a database on the Net which is updated monthly and we have had no access problems. It's text-only, but in your case, pictures to download shouldn't present any great difficulty (though remember that downloading video segments can be time-consuming for the average user).

Anyway, what do we mean by a lot of work? You have three choices:

1. *Design the database twice; once for the CD-ROM and once for the Internet.*
2. *Design one database and a single front-end which will be distributed on the CD-ROM. Internet users can download the front-end, so they can view the database, using ftp.*
3. *Design the database for the Internet to be viewed via a standard Internet browser, and also distribute copies of the browser on the CD-ROM version.*

Which method you decide to use will depend on the size and complexity of your database.

As for any good books which address this area, there are many on databases, multimedia and the Internet, but we've never seen one that specifically covers the subject of designing multimedia databases for the Internet and CD-ROMs. If anyone out there knows of any, please let us know.

● I read an article some time ago [*PCW*, July 1995] in which Karl Dunkerley wrote about the program MediaStudio 2.0. Dof you know how to contact U-Lead to get some more information about the program (email, fax or telephone number)?

Maybe you know whether there is a demo version of the program somewhere on the Internet or on a BBS.

Robert Maliszewski
<robert-m@dsv.su.se>

U-Lead's Media Studio 2.0 is available from BIT (UK) on 01420 83811. A demo version will be available by the time this goes to press. We plan to include it on the cover CD.

● Myself and a couple of friends are considering trying to create our own CD-ROM. We have been in touch with a CD pressing firm in London, and they have told us their prices for actually cutting the CD; they will also accept the finished item either on removable hard disk or backup tape.

The problem is that it seems to be very difficult when it comes to deciding on a particular authoring program, as there's a lot to choose from. We are anxious not to spend a huge amount of money on the program, as that would leave us penniless when we come to cutting the disk; our resources being quite limited. Obviously we cannot aspire to producing anything like Encarta, but we would like the finished article to be reasonably up to selling to Joe Public.

We live in the Peak District and our idea is to create a CD-ROM guide to the National Park, perhaps limiting ourselves to an initial run of a thousand to see how they go. This means that spending the best part of £1,000 on a program like Director is not a realistic option.

Your advice would be much appreciated. Also, any info you have on any aspect of making a CD-ROM will be useful.

Nicholas Buttle
Tideswell
Derbyshire

We have just the answer you want to hear. It's not often that we recommend a single product for anything, but since your budget is so low you probably can't spend more than £200 on software. So have a look at the review of Illuminatus 3.0 on these pages, and on this month's CD.

Bear in mind, however, that the average multimedia title costs in the region of £100,000 to produce, if done properly. We're not saying that yours can't be done a lot cheaper and we certainly don't want to put you off, but make sure you've taken into account all possible costs. Think about original photography versus copyrighted pictures; recording sound so that it doesn't give an amateurish feel; the amount of time required for writing the text (or paying for permission to reproduce it); and designing, testing and debugging.

Find the hidden jokes; an example of one of the games in Illuminatus 3.0

fit the frame or change the background colour.

But you don't just have frames. Templates also contain buttons for various actions such as displaying an image, playing a sound or video file, moving to a different page, or even launching another Windows application. You can test the button-controlled actions at any time as you design your application.

In this way you make up pages, giving each one a name which will later be used to set up a navigation list.

There's a facility for creating a distributable copy of your application, and this can be on floppy disk or CD-ROM. If you're distributing on floppy disks, Illuminatus compresses the files into suitable chunks to fit the floppy disk size you're using.

Perhaps equally important is the fact that Illuminatus can create executable files for your applications which don't require a runtime player. Furthermore, Illuminatus applications can be run from other programs, thus extending their flexibility. Some of the program's specialist functions are ready-supplied as extension modules, such as one to keep scores if you're designing a quiz, computer game or CBT application.

With a price tag of £200 and no programming language, don't expect the sophistication and complexity that come with more expensive multimedia authoring tools. But remember that some of the most successful commercial titles are pretty simple both in structure and design.

PCW Contacts

If you have any multimedia-related problems or queries, email us at **g.c.jacobs@swansea.ac.uk**. We're sorry, but we can't answer queries by personal reply — we'd be at it all day! But we're glad to publish queries, with our answers, which we think will interest *PCW* readers generally.

Asymetrix products from ICS Solutions **01256 469460**
Illuminatus 3.0 from Digital WorkShop **01295 258335**

Pick 'n' **mix**

Good production and mixing can enhance your work no end — Steven Helstrip explains how to max your trax. There's a new regular item on chords, too, and news of the latest sampling CDs.

I was considering changing the name of this column to *Hands On Sound and Sampling CDs*. After all, I talk of their wonders all the time and they have become almost as important to making "modern" music as the sampler itself.

Walk into a typical studio and in addition to the mixing console, a pair of Yamaha NS10 monitors and a rack of outboard gear, you can be sure to spot loads of sampling CDs. Whether it's because we can no longer program our own drum loops and bass sounds, or because sampling CDs simply save a lot of time, I'm not sure. But one thing is certain: sampling CDs are here to stay.

Rhythm Guitar & FX, one of the Creative Essentials Sampling CD series

Time for a new collection

Just when you thought that there couldn't possibly be any more room for new products, Time + Space brings out a whole new collection called Creative Essentials. At less than £20 each, this collection is intended for musicians new to sampling and perhaps the professional who's strapped for cash. There are 30 discs in the series that cover practically every conceivable style of music. They should also appeal to games and multimedia developers who will find hundreds of special effects and weird sounds included. As well as containing audio tracks, each CD provides the samples in 16-bit Wave format on a CD-ROM partition.

So are they any good? I listened to the first ten in the collection and was surprised at how many samples you get for your pound; there are between 200 and 400 per disc. The quality of the samples is consistently high, although some of the CDs have a disappointingly limited range of ideas and styles. Two discs that are worth checking out are Rhythm Guitar and FX, and Dance Vocals. For more info, call Time + Space *(see page 327)*.

Structurally sound

No matter what anybody says, a good song is a good song — even if it has been recorded directly onto two-track tape using nothing more than an acoustic guitar and a vocal. Any record company can spot a good song, so even if you haven't had the opportunity to give it the "big" production, you should still submit your work. Nevertheless, it's incredible what a difference production can make. Over the next couple of issues, we'll be looking at production and mixing ideas that can transform tracks using a few simple tricks.

Laying the groundwork

Once the song has been written, spend some time building a picture in your mind of how you want the finished track to sound. A good song can be recorded with most tempos and styles, so decide what kind of overall feel it needs, whether it's rock, dance, jazz or Bhangra. Also decide what instruments you want on the track; will the whole track be sequenced and use samples? Would a live guitar add to the production?

If you're running low on ideas, listen to a few CDs in your collection and you'll be able to hear what ideas have worked for other artistes. There's nothing wrong with "copying" production ideas, provided your song doesn't end up sounding exactly the

same as somebody else's.

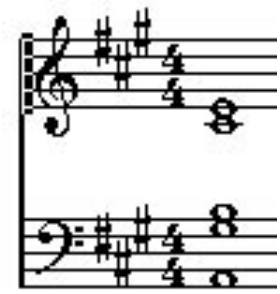
Before committing yourself to recording the track at a studio, work at home or with your band on the pre-production, which is simply building a rough idea of how you want the track to sound. You might not have all the effects and a 20-piece orchestra to work with, but it does give you the opportunity to try out new ideas.

It's always helpful — if not a necessity — to have an outside opinion at the pre-production stage, so take a friend along to the studio or rehearsal. If you have the time, record as many different ideas as you can — listening to the result at a later stage, with a fresh pair of ears, will allow you to be a better judge of what works and what doesn't.

When working on the pre-production don't worry too much about the overall mix — your time will be better spent getting the instrumentation and arrangement right. Do, however, spend time with the vocal: after all, this is the most important part of any song. Try to think of it as the icing on the cake.

Chord of the Month

This new addition to the Sound column is to cater for the high level of interest in chords. Every month from now on, we will be introducing a new chord. Eventually, we will run out of chords and have to start over again, but that won't be for several years.



This month's chord is **A maj7/9**. The notes in the chord are:
A / C sharp / E / G sharp / B

It's a fantastic chord to go to in the chorus of a song containing a verse written in A minor — try it.

Loopism's AWE32 Compilation

D-Zone was the first company to introduce low-cost sampling CDs and its Loopism collection is great value. The CDs cost around £10 a time, each comprising 25 drum loops and up to 100 instrument samples. Although on each CD you may find only a handful of instrument samples that are worth using, every loop can nevertheless be described as brilliant, professional, inspiring, up-to-date, classy… the praise goes on.

The AWE 32 Compilation contains every loop and sample from the first six CDs: that's over 850 samples covering just about every genre of dance music. Of course, you will need an AWE-32 to access these loops but there are few people who don't own one; if you're one of them, then it's worth the investment if you're looking for a low-cost sampler.

The CD is sectioned into two folders, loops and soundz. Under the loops folder you will find sub-folders arranged by tempo ranging from 64 to 172bpm.

Loopisms AWE 32 compilation

Each loop has been edited and looped and is ready to download to on-board RAM. It is recommended that you have 2Mb installed on your card, since some of the sound banks are larger than 512Kb.

Under the soundz folder you will find a further six folders for each of the six CDs. Samples have been taken from such synthesisers as the Vintage Keys, Korg M1, Juno 106 and Matrix, and drum machines that include the TR909 and TR808. My only criticism of the drum samples is that the sounds haven't been key grouped or mapped across the keyboard. Instead, each sound has to be accessed by sending a program change message. Thus, if you want to use six of the sounds from the TR909 kit, you'll need to reserve six MIDI channels instead of just one.

This is the definitive AWE collection to date. And at £29.95, it's an absolute bargain.

● *Loopism's AWE 32 Compilation is distributed by Time + Space.*

A big mistake many bands make is to spend all day recording the instruments, so by the time it comes to the vocals it's half past three in the morning. By this time, the vocalist is absolutely knackered and cannot perform to his or her best. If you have access to a sampler, it's a good idea to record a rough guide track and lay down the vocals first. Later, these vocals can be sampled and added to the track.

Fig 1 Outline of a typical commercial song structure

Intro (perhaps the chorus)	Try and keep it to around eight bars.
Double verse	Two verses; eight bars each.
Bridge (optional)	An eight-bar phrase that links the verse to the chorus. A good section in which to introduce strings and build on ideas.
Chorus	Again, usually an eight-bar section — this is the most important section and should contain the hook. The hook (the catchy bit) doesn't necessarily have to be the vocal; it might by a keyboard riff, or include both.
Link (optional)	A one, two or four-bar section to link the chorus and third verse. It gives the listener a short "rest" from the song, too.
Verse	Try to make this verse "bigger", which might mean adding percussion, a more solid rhythm track, or new musical ideas.
Bridge	The second bridge may use the same lyrics as the first. Musically, it can remain similar to the first.
Double chorus	Your chance to firmly "implant" the hook on the listener.
Middle eight	This section should take the listener on a different journey. It may be in a different key, have new instruments playing and contain new lyrics. It may just be a repeat of the bridge using different instrumentation; strings only, for example.
Outro	Four "full on" choruses. You might have a counter-melody and lots of vocal ad-libs. The easy way to end the song is to fade out, although a definite end can work just as well.

Hook, line and sinker

If you're working to a commercial structure, your track should be no longer than four minutes. Try to get the main hook into the track within the first 30 seconds; usually the chorus. This will keep the listener interested. Starting the track with the chorus is very popular these days and it usually works. I have outlined a typical commercial song structure, in *Fig 1*, for you to use as a rough guideline.

Probably the most important thing to remember at the production stage is the saying "If it sounds good, then it's right". Regardless of how wacky your idea may sound, or look on paper, try it out. You may be pleasantly surprised. At the same time, try not to be precious about your work; if it sounds good to you but nobody else "gets it", then try something else.

● *Next month: more production ideas, and a closer look at mixing.*

PCW Contacts

Readers' contributions to the Sound column are music to our ears. If you have any hints or tips, any MIDI-related items or general comments, send them in to the usual *PCW* address, or to **steven_helstrip@pcw.ccmail.compuserve.com**

Time + Space (Creative Essentials and AWE 32 Compilation) **01442 870681**

Brushing up the VB image

Where next for Visual Basic? Tim Anderson investigates VB Script and the likely features of Visual Basic 5.0, looks at a strange performance test, and tries out new balloons and buttons.

VB 4.0 may have some great new features, but many developers have found it slow and unwieldy thanks to its huge runtime files. Others have jumped ship to Borland's Delphi. On another front, Sun's Java looks set to be an Internet standard and perhaps popular for general development as well. Despite VB's huge installed base, the pressure is on Microsoft to restore its tarnished image. The company is responding, first with a cut-down VB for Internet scripting, and second with a brand new version of the main product. I spoke to Jon Roskil, Microsoft's director of marketing for Visual Basic, about the new developments.

"VB Script is a semantic subset of the Visual Basic for Applications language, but without file I/O. That makes the language safe, sand-boxed like Java. It will be part of Internet Explorer. You will have embedded VB script in HTML on a Web site, and the VB routine will execute on the browser. For example, you could do data-field validation on a Web form." Web solutions need to be cross-platform, and Microsoft aims to achieve this with third-party help. "Microsoft VB Script will be for all Windows platforms, 16 and 32-bit, and for the Mac. Other vendors will supply

Fig 1 Delphi vs VB — is it really faster?

On Microsoft's Web site are two documents prepared by the "Carnegie Technology Group", which benchmarks the performance of Visual Basic 4.0 against its most obvious competitors. One compares VB 4.0 (32-bit) with Delphi 1.0 and Oracle's Power Objects. The report's remarkable conclusion is that: "Visual Basic and Delphi are very closely matched in the language performance." For example, one of the tests measured loop performance, and VB was found to execute 1,000,000 loops in about 1020ms, while Delphi took 1330ms.

The result is so surprising that I set up a similar test on a similar PC. Carnegie Technology explains that the loop looks like this; where α is the number of loops:

```
i = 0
t0 = GetTickCount()
do while (i< α)
i = i + 1
loop
t1 = GetTickCount()
total = t1-t0
```

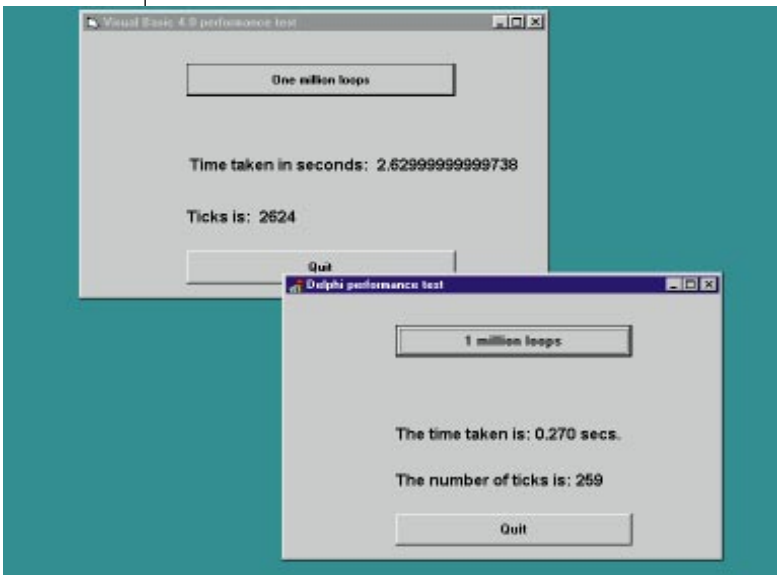
The result of our test was that VB took 2568ms to execute one million loops, while Delphi took 261. In other words, Delphi was nearly ten times faster, exactly what one would expect. This loop test is vulnerable to a clever compiler avoiding the loop by simply setting

```
i =α
```

and not bothering with the loop, although neither Delphi nor VB seem to do this. Traditionally, a loop to filter out prime numbers is preferred, since this can only be done by iteration. A routine to find all prime numbers between 1 and 32000 took VB 1934ms, against Delphi's 560.

After these brief experiments, I still find Carnegie Technology's report surprising. The experience of most developers is that Delphi's compiler yields a very substantial speed advantage.

In our tests, Delphi proved about ten times faster than VB on simple loops



implementations for further platforms. There will be a C source code reference as a free download on the Internet." Since VB is interpreted, the scripts will run on any platform for which runtime files exist. As with Java, this is a key advantage for Internet development. VB Script should be available by the time you read this.

As for VB 5.0, Jon expects it to be released before the end of 1996. It is further enhanced for OLE development. "We can create OLE controls in the next version of VB." A lot of this technology is already there in version 4.0, which can create in-process OLE servers, but the missing piece is an event-layer interface which goes on top. Naturally, Jon sees these OLE objects having a role on the Internet. "VB objects can be called from HTML. We have some pieces called 'shims' in Internet Explorer, which let HTML talk to ODBC or OLE. Internet Explorer will also host OLE controls and OLE document objects."

Speed is the key

VB 5.0 is rumoured to include the long-awaited compiler. While he will not confirm this, Jon admits that this is "on our wish-list, and very near the top. But a compiler is no panacea for performance issues. In client-server applications, data access speed is the key. And the VB language engine is fast. There are benchmarks available on our Web site which show VB against Delphi, PowerBuilder and Power Objects. The VB language engine is ahead on four out of nine tests." So why have developers found VB 4.0 slow? "We optimised VB for the 32-bit platform, not 16-bit, although it can create 16-bit applications." A tacit admission that VB 4.0 16-bit *is* too slow.

VB standalone, VBA for Microsoft Office, and now VB for the Internet. It sounds promising, except that most Internet users browse with NetScape, and NetScape is by no means certain to support VB Script. Performance is another concern. VB is certainly fast as interpreted languages go, as long as there is enough RAM to handle the runtime load. But despite Microsoft's optimistic performance tests (*see Fig 1*), it is nowhere near the speed of Delphi or C++. Maybe the promised compiler will close the gap. Otherwise, it's hard to imagine VB succeeding as a tool for developing OLE controls.

Getting Resourceful

Visual Basic 4.0 supports standard Windows resource files. These contain strings, bitmaps and other data, and are particularly useful for international projects. By changing the resource file, for example, you could display text in French instead of English. Resource files can improve form load times, since the data is not loaded into memory until required by your application. Since the resource files are standard, they may also be useful if you decide to port your application to another environment.

Resource files begin as scripts (.RC extension) and are compiled as 16 or 32-bit binary files (.RES). VB can only use the compiled type, and these must be 16 or 32-bit according to the version of VB 4.0 used. There's no resource compiler supplied with VB, but there is one supplied with most C++ packages, including Visual C++. Here's a simple example:

1. Run Visual C++ 4.0 and choose File — New — Resource script.
2. On the Insert menu, choose Resource, and select String Table.
3. In the grid which appears, double-click the top row. Enter an ID of HELLO_STRING and a caption, "Hello", and close the dialogue. On the next row, enter an ID of GOODBYE_STRING and a caption, "Goodbye".
4. Use Save As to save the resource. A good tip is to use a subdirectory of your VB project. Save it first as a resource script, and then as a compiled resource called VBENG.RES.
5. Now amend the captions to "Bonjour" and "Au revoir". Use Save As to save the amended resource to a new directory, and call it VBFR.RES.
6. Create a suitable VB project. This example just displays a label and a button to exit the application. Use Add File to add VBENG.RES to the project.
7. Add Const definitions to define the IDs used in the resource file. For example:

```
Const HELLO_STRING = 1
```

If you open the RESOURCE.H file created by Visual C++, you will find #Defines for each ID. You can use this as the basis for the VB Const definitions.

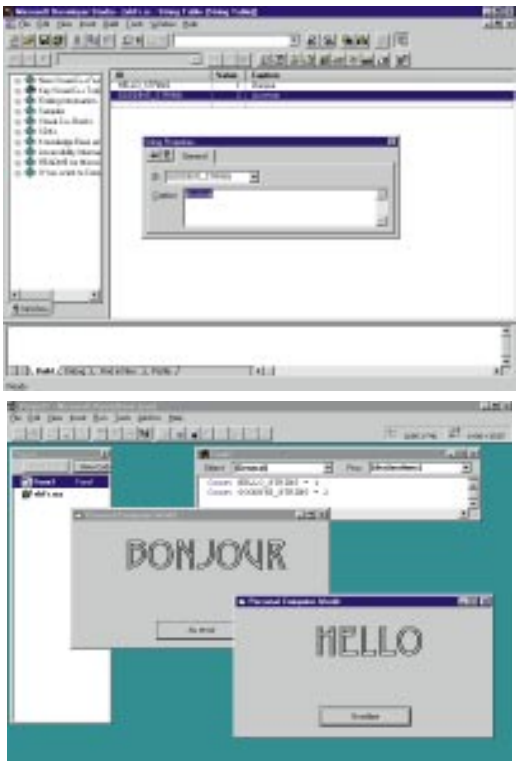
8. Now you can use the VB function LoadResString to access the resource file. For example:

```
Label1.Caption =
LoadResString(HELLO_STRING)
```

To change the language of your application, remove VBENG.RES from the project and replace it with VBFR.RES. When you compile an executable, the .RES file will be bound into it, so it does not need to be distributed.

Finally, do not include an icon resource with an ID of 1, as this is reserved by VB for the application icon.

Resourceful



Top *There's no resource editor supplied with VB 4. In this example, Microsoft Visual C++ is used to create and compile the script*
Above *It's all done with resources — a multi-lingual VB application*

Balloons and buttons

The standard Windows button is square, drab and grey. No more, if Farpoint's ButtonMaker catches on. Supplied as 16 and 32-bit VBX, OCX and DLL, this button control has a border divided into user-definable segments so that an enormous variety of shapes and styles can be defined. You can also tweak the "grey area", by which FarPoint means the area within the control but outside the bit that gets clicked. Here you can place colours, patterns, pictures or even animation to bring your buttons to life.

If buttons are not enough, the ButtonMaker package includes a balloon control. Balloons are the ultimate tool-tip, and although not quite as flexible as buttons in shape, they can take on a variety of forms, including a fluffy thought-cloud.

Nice idea; but so what? I guess there may be occasions when a ButtonMaker button is just the thing to make an interface more attractive or intuitive, but many of the supplied examples merely look silly. They are also disappointingly slow to load, especially in OCX guise. Finally, it would be nice to see component vendors recognising the existence of Delphi by supplying VCL wrappers to use with their products.

A button for every occasion, with FarPoint's ButtonMaker control

Moving to Visual Basic 4.0

Alan Knox asks:

"I have been trying to use your tip on how to make a window appear on top of all others (PCW November 1995) and can't get it to work. I am using VB 4 but I wouldn't have thought this would make any difference. The declarations are in a Global.bas file and I set the topmost flag in the load section of the form I want to appear on top. Any ideas?"

A window can be permanently set on top by calling SetWindowPos. The function declaration printed in November's issue was for Visual Basic 3.0, but should work the same way in 16-bit VB 4.0. But the 32-bit version needs changes to API declarations. For a start, they are located in different libraries such as USER32.DLL rather than USER.DLL. Next, integer parameters generally change to long. Third, Win32 has case-sensitive function names. A good tip is to use the API text viewer to find the right declaration. Next, use compiler directives to bracket the declarations so VB sees the right one *(Fig 2)*.

In fact, Alan may have done this and still seen problems. There is a bug in VB 4.0 which causes the topmost setting to be lost when you task-switch to another application. The good news is that this only occurs in the development environment, and not in VB apps compiled to an .EXE.

Fig 2 Directives and declarations

```
#If Win16 Then
Declare Sub SetWindowPos Lib "User" (ByVal hWnd As Integer, ByVal hWndInsertAfter As Integer,
ByVal X As Integer, ByVal Y As Integer, ByVal cx As Integer, ByVal cy As Integer, ByVal wFlags
As Integer)
#Else
Declare Sub SetWindowPos Lib "User32" (ByVal hWnd As Long, ByVal hWndInsertAfter As Long, ByVal
X As Long, ByVal Y As Long, ByVal cx As Long, ByVal cy As Long, ByVal wFlags As Long)
#End If
```

Visual Components on the Net

The explosive growth of the World Wide Web means keen interest in HTML authoring tools. Visual Components, which supplies the popular Visual Tools Suite, has announced Formula One/NET which lets you embed a spreadsheet component into an HTML document. Users who have NetScape Navigator 2.0 along with the Formula One/Net add-on can use the worksheets interactively, entering new data and performing calculations.

At the time of writing, the product is not available. The announcement is interesting, however, since the concept of a visual Web component is a natural extension of the visual development model. There are numerous problems: connection of a Web worksheet to a backend database is not trivial, for example. Also, full use of Formula One/NET requires the Windows version of NetScape. Although handicapped by the current battle to establish Internet standards, visual components for the Web look likely to be the next big growth area in visual programming.

Visual Components Inc. has become a subsidiary of Sybase, putting the company into the same family as PowerBuilder, Watcom, and the Sybase database server products.

PCW Contacts

Contact **Tim Anderson** with your comments, queries and suggestions, either at the usual *PCW* address or email **freer@cix.compulink.co.uk**

Visual Components Europe
01892 834343
FarPoint's ButtonMaker costs £75 from **Contemporary Software** 01727 811999

Lining up **Linux**

Stephen Rodda **blows his stacks, plays with Linux, and meets a rather nice couple called ed and vi.**

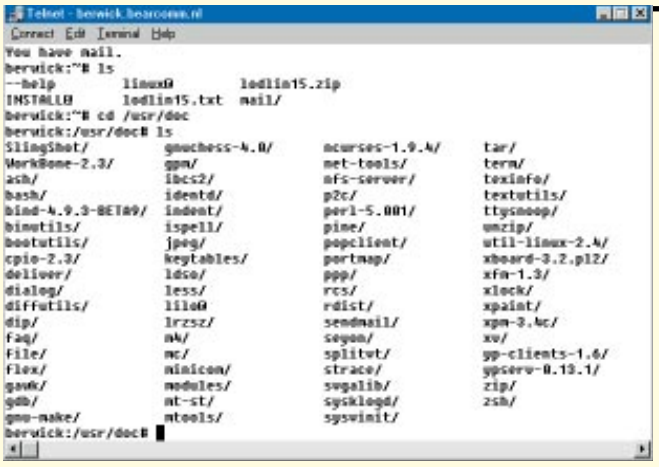
"If anyone anything lacks,
He'll find it all ready in stacks,
He's but to look in on our resident djinn,
Number seventy St Mary Axe."

I don't quote Gilbert and Sullivan's "The Sorcerer" often, but this particular piece describes adequately how I've been feeling recently. I'm not referring to my state of health, but to the almost limitless number of Winsock-type stacks which seem to be lying around open-mouthed ready to swallow any unsuspecting installer of almost any communications software which accesses the Internet.

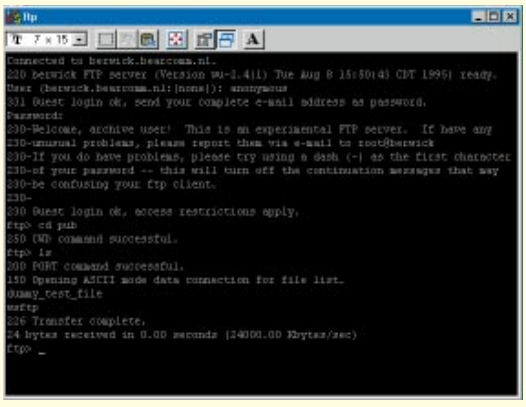
First, I installed a rather useful piece of software called Turnpike. This had its own Internet Winsock stack. Then I installed Spry Internet, a CompuServe offering. This in turn required its own Winsock stack. One of them (I can't remember which, though I think it was Turnpike) even wanted to overwrite Windows 95's own Winsock stack. Diabolical, I call it.

Why can't these people run to using (or reusing) someone else's stack? It's not as if it's that difficult, I'm sure. Everyone else seems to be able to get away with it.

One day, as in Gilbert's libretto, they'll have to listen to some of the Sorcerer's last words: "So be it. I submit: my fate is sealed; to popular opinion thus I yield." Only I wish they'd have done it *sooner*.



Left *A Telnet session from a Windows 95 PC showing the connection to the Linux server*
Below *An FTP session, using Windows' own FTP client*



Lines on Linux

I've also been playing with Linux (available on February's CD). Now, it's been a very long time since I played with an operating system which was as resolutely character-based as this — apart from NetWare, of course. The last time I looked at a Unix derivative was probably about five years ago, but I was persuaded by the fact that it had X Windows and that I should know how to use it. Well, I did, a bit. I've used a Silicon Graphics workstation, which uses an X Windows-type shell, and Suns and so on, but this is the first time I've actually *installed* one. I've installed ordinary character-based Unix before, but not X Windows.

The character-based installation went pretty well — apart from me being silly and forgetting to change the backslash to the forwardslash through habit — even though I forgot where in the scheme of things I had left my installation disk images. After a couple of hours, I eventually got myself a bootable installation. The problem lay in the fact that my Videologic PCI movie card with a Weitek P9100 wasn't supported. I tried a P9000-based card as an option. No good.

I had a go at an SVGA installation with similar success. I even tried VGA_16 and VGA_MONO, but these were also met with scorn by my hardware setup. Eventually, I swapped the card out and replaced it with a Trident TVGA8900, and found success. X Windows was up and running. Or rather, crawling. Even Windows 95 ran faster that it did. I was quite nonplussed.

I suppose one reason could be the fact that I used an UMSDOS file system. For those of you who wouldn't know an UMSDOS file system if it bit them (the same as I was until a couple of weeks ago), it's a method whereby Linux can access MSDOS partitions as though they were Unix ones. They even have extended file

names, although these attributes aren't compatible with Windows 95 or NT. Goodness only knows where this information is actually stored, because *I* certainly don't.

The other piece of unbounded joy Linux gave me was the chance to get to grips with ed and vi. I have always been on a nodding-type of acquaintanceship with ed, but vi has always left me cold. Say what you like, but I never can seem to remember the right incantation to get to command mode in vi. Eventually, I wimped out. I installed Joe, supposedly a WordStar lookalike text/word processor.

Hey Joe

Only it's not really that lookalike. WordStar is one of those word processors which you really get a feel for when you've used it for as many years as I have. Unfortunately, the command keys are almost, but not quite, exactly unlike those of WordStar. I later found that invoking Joe with "jstar" enabled total WordStar compatibility, as opposed to the Emacs command set. I've learnt enough different key combinations, from Wordwise, View, WordStar and dBase, through Visicalc, Lotus 1-2-3, DisplayWrite and WordPerfect 4.1, not to want to have to learn another one.

Once I had installed and got X Windows working, I was more or less in my element. Having said that, I still reverted to Joe to edit my text files, which I seemed to be able to do without too much trouble; the X-Windows text editors looked to me to be more along the lines of vi than anything else.

How did it get along with the rest of my hardware? I'm glad you asked. It recognised the Adaptec AHA2940 with no problems, as, of course, it did with my hard disks. Since it was using the UMSDOS file system, I could get it to mount and recognise all of the DOS partitions without any problem; in fact I was pretty relieved at that. The ancient Mitsumi CD, although supported in the operating system, I didn't seem to be sufficiently clued-up to be able to mount as an integral part of the file system.

Tip of the Month

You can use your Microsoft Exchange personal addresses and those in Schedule Plus elsewhere by opening the relevant files in Microsoft Word 7.0.

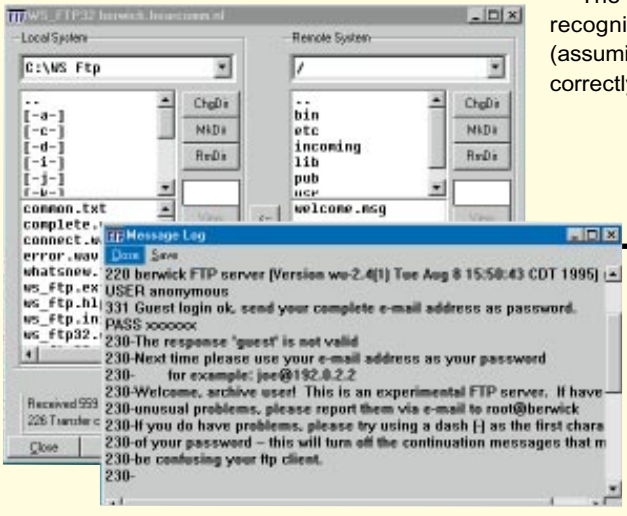
Kernel kapers

Then I found out why. The kernel I was using (straight from the Linux installation) hadn't got Mitsumi support built in. Now what was I to do. "I know," I thought. "I shall recompile the kernel." Well, it was a lot easier than I suspected, apart from the fact that the 1.2x kernel didn't have support for my Adaptec 2940 card. Nevertheless, the 1.3.20 kernel is available on disk images K3 to K5 and so I used those.

Brilliant — it worked right through compilation and gave me a kernel which ran very nicely, but only after I had enabled anything which had the word "Elf" in it. Without this option enabled, I couldn't get it to compile successfully.

With this done, I set out to get Linux attached to the network. Of course, it wouldn't see my copy of NetWare 3, simply because NetWare 3 doesn't have built-in TCP/IP support. I did manage to get another Windows PC to see it, though. Note that I used unrouteable TCP: that means that these IDs are specifically excluded from being routed over the Internet. The 192 series is one such, and you can use them if you want to disable connection of your network to the Internet or interference from your own network with the Internet. The only way to achieve full Internet connection is to have your own series of Internet IP address numbers (often supplied by a service provider).

The thing that stops PCs recognising a Unix file server (assuming all the TCP/IP is set up correctly) is simply the fact that



A smarter version of the FTP session, using WS FTP

Problem solving: MSN and Demon

Microsoft Network causes problems at home

I am a radio producer for Kiss FM in Athens (Greece), now doing my MSc in Communications and Signal Processing at Imperial College, London. I have formed a small network at home, where I have two 386DX/40s and one 486SX/33, all with 8Mb RAM and running Windows 95. When I tried to use Microsoft Network as the networking peer-to-peer software (replacing the older NetWare Lite 1.1 which forced 16-bit file and disk access) I experienced all kinds of problems.

I use the 486SX (manufactured by HP) as my "fileserver", storing and retrieving all my data files to and from it respectively. I use Microsoft Word 6.0 (or 7.0) for word processing and Microsoft Access for database applications. The problems started appearing in the form of lost files (files which could be seen using the "dir" DOS command but which Word was unable to read). Moreover, whenever I tried to copy large (500Kb or more) files from one computer to the other, the whole system hanged and I had to reboot all machines.

Finally, whenever I tried to network print to my HP LaserJet 4L, the documents were printed correctly if I used single-sided printing. If, on the other hand, I wanted double-sided (first printing the odd and then the even pages), page and font formatting was correct but the words printed had no meaning (for example, "hello" would print "kfgle"). I suspect that the printing problem is part of the network traffic problem I described earlier, as the computer that is printing sends data over the network to the one where the laser printer is attached to.

When I removed Microsoft Network and substituted NetWare Lite, everything worked happily, although 16-bit functionality returned, happily ever after. Do you have any suggestions, as I have no idea where the problem lies.

SK@ic.ac.uk

I don't really know what the problem might be here, but I'd hazard a guess that one of your network cards is not working correctly. The real way to test this would be with a LAN analyser, and since you're at Imperial College, someone may be able to help you there. Alternatively, you can get hold of a spare network card to swap one or the other out, and see if the problem persists. If it does, then swap the other card.

You don't mention whether you get garbled output when printing the second side of the document from the host computer (the one with the printer on it). If that were the case, I'd suggest that it's an unrelated problem, i.e. that the printer is running short of memory and can't hold all the fonts you might be using.

Have you tried using the built-in TrueType fonts within the printer rather than downloading fonts to the printer (my apologies if you already are)?

Demon leaves files open to unwanted scrutiny

I have set up the Windows 95 Dial-up server (from the Plus! software package) and enabled file/printer sharing from the Networks settings in control panel. So far, so good. However, when I connect to Demon Internet using my modem, my files and printer are open to access by other Internet users. To overcome this, I have to disable file/printer sharing using the network settings in the control panel. They then have to be re-enabled in order to allow incoming calls using the dial-up server.

As you can imagine, this will be a bit of a bind for any of my clients to manage (many of whom have only recently been introduced to computers). Do you know any way to avoid this long-winded process, while maintaining the security of a computer that will be used for dial-up access to the Internet?

ch@mc.demon.co.uk

I have already sort of mentioned this problem in this column this month. There are several ways you can look at the problem, and these range from the pragmatic to the paranoid.

Firstly: since you're using a dial-up connection to the Internet, someone would have to be sitting there, lurking, checking whether you were there or not. Not the sort of thing I would want to do when there's paint drying to be watched. You could also take the stance that nobody would want to print to your printer anyway and (unless it were PostScript) there's no possible harm they could do having printed, except to use some of your paper and ink or toner. Assuming, for a moment, that they were assiduously waiting, they would have to be using the Microsoft client in order to access your files anyway.

The second thing to do would be to add password protection to your shares, and this way anyone using a Microsoft client (or Samba) would have to supply the password as well as your IP address to access the data or the printer. The third line of defence would be to purchase or set up a firewall. This would involve using (perhaps) a Linux or Unix or NT box which would be quite safe and prevent any unwarranted intrusion.

The final method (the sort that would probably be insisted upon by the government) would be to incorporate steps 1 to 3 with the provision of leased lines for your clients' access. This way, the whole system would be far more secure, and would have the added advantage of knowing where the calls were coming from. Of course, the expense would be quite terrible, because each client would have to have their own line with a router on each end of each line.

Personally, I'd be inclined to go with option 1, but you pays your money and you makes your choice.

the server is operating at a lower level than Windows expects. You can't just expect to mount a drive and to work on files on a Unix hard disk just like that; you have to transfer them. Also, you can't just start work on the thing like a NetWare server; you have to use Unix connectivity utilities first. Now I logged on to the Unix machine with a TCP/IP terminal-type program, Telnet (which comes with Windows 95). I also transferred files using ftp (which also comes with Windows 95) and with WSFTP and Cute ftp — included on this month's CD.

This month's CD

I'm including Service Pack 3 for both NT 3.5 and NT 3.51, CuteFTP and WSFTP (16- and 32-bit versions of both) and four patches to Linux to take the kernel source code from 1.3.20 to 1.3.24.

Those of you with HP's Colorado and SureStore tape drives are having a bad time too, so I'm also including HP's latest backup offering 95CBW151.EXE — Colorado Backup for Win95 version 1.51.

I also installed Samba as a networking protocol, in order to allow Linux to see Microsoft LAN Manager-type connections, but I shall be going into that in fuller detail next month, along with the modifications I made to the network to enable the Linux server to coexist happily.

PCW Details

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Desktop **doctor**

Even an Apple a day may not keep the doctor away. Chris Cain shows you what to do if you find yourself with a sick Mac. Plus, there's QuickTime movies on startup, more extensions, and the mania of Marathon 2.

By the time you read this, January's MacWorld Expo '96 in San Francisco will have been and gone. I didn't manage to get over to the show this time around but judging by reports that have been coming in, I didn't miss that much. Most of the software on show was apparently the same as it was last August, and the news centred on Apple posting a substantial loss for the final quarter of last year. Layoffs were certainly looming.

All this on top of the fact that Mike Newton is now former Managing Director of Apple UK has led to a large degree of uncertainly and speculation about the future of the company. Rumours abound that Apple is about to re-organise and drop its low-end models, which sold well over Christmas but don't bring in much profit and can't really compete in a price war with cheap PCs. Also, according to industry analysts, a takeover is once again imminent with Sun, Sony and IBM as the front runners.

Despite these setbacks, there is some good news. Apple is said to be releasing two new PCI-based Performa models towards the spring of this year. The details are sketchy, but according to reports the systems, code-named Elixer and Chimera, will use a 100 or 120 Mhz 603e PowerPC processor and be available in an all-in-one design, like the 5200, or a standard modular version. Both models will support up to 136Mb of RAM and have a slot for a 7-inch, 32-bit PCI card.

Chimera is set to replace the current 5200 series of Performas, while Elixer takes over the 6200/6300 series. Common specs include a 1Gb Enhanced IDE hard disk, quad-speed CD-ROM drive, 16-bit sound, and free slots for communications, video-in, and TV tuner cards.

At the movies

This month while reading though some of my old Mac books, I came across a page that told me how to make a QuickTime movie that plays on startup. All you have to do is select a movie file, rename it Startup Movie, drop it into your System Folder and away you go. The next time the Mac starts up, the movie will play as soon as the QuickTime extension is loaded. It's that simple.

Not being one to turn down a challenge, I made my Startup Movie and restarted the machine, eager to see it action. I now wish I'd never laid eyes on that book, because it showed up a problem with my System software that I'd never noticed before.

The process worked fine, the movie sprang into life, but after booting with a Startup Movie anything else that tried to use QuickTime failed. MoviePlayer died with an "Error of Type 1" and, worst still, mission critical applications such as Doom II refused to load. Eventually, I tracked down the problem using the three basic rules of Mac problem solving.

Step one when attempting to solve a problem of this sort is to rebuild the mystical desktop file. You rebuild the desktop by holding down the Command and Option keys on startup, then clicking OK in the dialogue box that eventually appears. The desktop file is a database where your Mac keeps information about all of the

Rebuilding the Desktop file can work wonders with a sick Mac

Extension List Part 2

To keep your Mac in tip-top shape, here's the second part of the latest Apple System Software revisions, as promised last month.

Extensions

Name	Version	Name	Version	Name	Version
MPW	3.3	PowerBook Display	7.5	Sound Control Panel	8.0.5
MPW C++	3.2	PowerBook File Assistant	1.0	Sound Effects	1.0
NetTrax	1.2	PowerBook Setup Ctl Pnl	7.3.1	Sound Manager	3.1
Network Control Panel	3.0.	PowerCD Setup	1.0.1	Speech Manager	1.1.1
Network Launch Fix	1.0.2	PowerShareCollaboration Server	1.1	StyleWriter	12002.1.1
Network Software Installer	1.5.1	PowerTalk	1.1	StyleWriter	GX1.1.1
Newton Connection (Mac)	2.0.2	PowerTalk for PowerPC	1.0.2	StyleWriter	II1.2
Newton Connection (Win)	2.0.3	PrinterShare	1.1.1	System Picker	1.0
Newton Toolkit	1.5.2b2	Quadra 950 Color Addition	1.0	System Update	3.0
Open Transport	1.0.8	QuickDraw GX	1.1.3	System 7.5 Update	1.0.2
Ofoto	2.0.1	QuickTake	1.0	System	7.5.2
OfotoColor	1.0	QuickTime	2.1	Printing Fix	1.1
PatchBay DA	2.0.1	QuickTime Conferencing	1.0	TeachText	7.2
PC Exchange	2.0.5	QuickTime Starter Kit	1.6.1	Telephone Manager	1.1.1
PC Net Exchange	1.0.1	Rename Rescue	1.0	Thread Manager	2.0.1
PC Setup	1.0.7	ResEdit	2.1.3	Token Ring Control Panel	1.0.1
PDD Maker GX	1.0.1	Responder	1.1.1	Token Ring	2.5.2
Personal LaserWriter	3001.2	SADE	1.3.2	TokenTalk	2.5.7
Personal LaserWriter	3201.0.1	Scanner	3.0	TV Setup Cntl Panel	1.0.2
Personal LaserWriter NTR	2.0	Screen	1.0.6	Type III Battery (Ext.)	1.0
Personal LaserWriter SC	7.0.1	Script Editor	1.1.1	Video (control panel)	1.0
PhotoFlash	2.0.1	Scriptable Text Editor	1.1	Video Monitor	1.0.1
PlainTalk	1.4.1	SerialDMA	1.1	VideoSync	1.0
Portable StyleWriter	1.0.1	Serial Switch	1.2	Virtual Monitor Switch.	1.0
PowerBook Control Panel	7.3.1	Serial Tool	1.0.2	Virtual User	2.0.1
PowerBook/DOS Companion		SimpleText	1.3	WorldScriptII	7.5
				Xmodem Tool	1.1

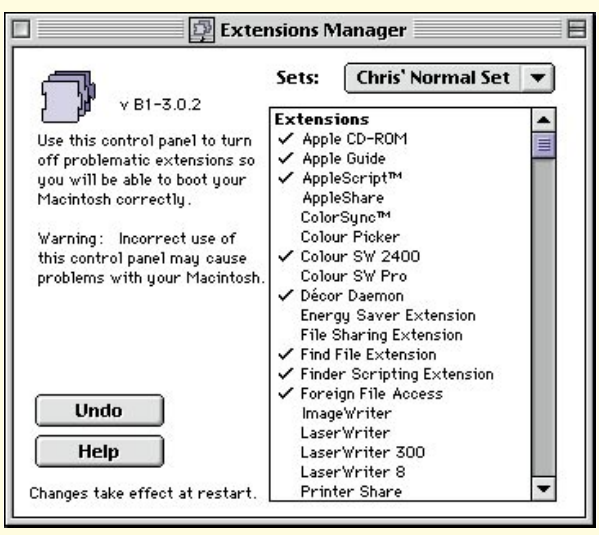
files it is exposed to, and it occasionally needs cleaning out and updating to keep things running smoothly. The whole process takes only a minute and can save hours of grief later on. A good habit to get into is to rebuild your desktop every Monday morning, or at least once a month to keep things in check.

If the problem persists, step two is to eliminate the possibility of an Extension or Control Panel conflict. Sometimes if you have a number of third party system extensions on your Mac, a badly coded one can interfere with another and cause the machine to hiccup. To help you control the loading of extensions, Apple provides a Control Panel called Extensions Manager with System 7.5.

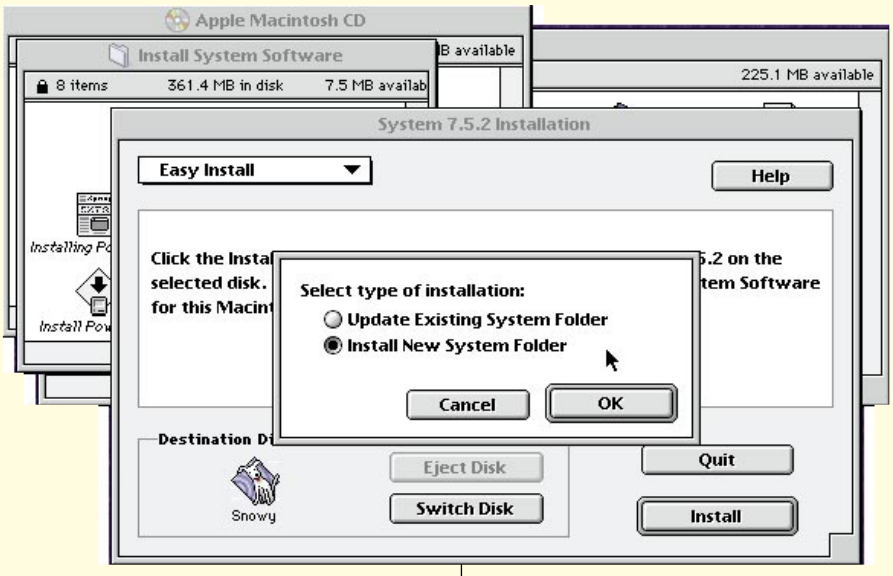
To check if an extension is causing the problem, first boot with the Shift key held down to start the machine with all extensions turned off. If the problem is gone, you know its caused by an extension. If the problem only occurs when using an extension, as in my QuickTime case, you'll need to boot with only bone-fide Apple stuff switched on using Extensions Manager.

Utility of the Month

The winner of April's Utility of the Month award is Apple's own Extensions Manager, thanks to its sterling performance in helping me track down the system software conflict which gave me such a headache this month. As well as being dead handy for troubleshooting, Extensions Manager allows users to set up and save different sets of extensions so that the Mac can be customised to best suit the job at hand. For example, you could save a set called Fun with nothing but QuickTime, CD-ROM bits and Sound Manager turned on and switch to it when you want to make more memory available to games. When you've finished, you can switch back to having a full system again, complete with networking and printer drivers. Well done, Apple.



The wonderful Extensions Manager: handy, simple and efficient



A clean system installation is often the only way to fix a problem

Now if everything works well, you should place third-party bits back one at a time, restarting each time to check the results. A process of elimination will reveal which item is conflicting.

If this doesn't work and you're still having software troubles, the third and final step is to perform a Clean Install of a new System Folder. For this you'll need a copy of the system disks that came with the machine, or a least a copy of the version currently in use.

Now run the Installer from disk one, but before proceeding with the normal Install routine, press Command + Shift + K. Up pops a hidden dialogue box asking if you want to Update or perform a Clean Install. Select the latter and the Mac will install a new System Folder, and rename the old one to avoid confusion. When it's finished, you can add your third-party extensions again, as in step two.

Of course, this isn't the be all and end all of Mac troubleshooting but nine times out of ten these three steps will cure any ills. If they don't, you can try resetting the parameter RAM by holding Command + Option + P + R on startup until the machine resets. You'll have to go back and set your disk cache to the desired size again, but this will clear out any corruption lurking in the Mac's battery backed-up PRAM. In a future column I'll go into this subject in more detail.

Speak easy

Finally, while researching events at the Mac show I actually found my first real use for that Text to Speech software that comes with all AV and PowerMacs. According to the people who attended, one of the best things about the show was the opening address given by Apple America president, Jim Buckley. So I searched the Net for a copy of his speech, found a transcript and downloaded it.

Later, while working on something else, I decided I'd never get time to sit and read the speech, so I hit upon the idea of having the Mac read it to me. I opened up the text file in SimpleText, selected my favourite voice, called Zarvox, and then Speak All. I returned to the Microsoft Word document I was working on and listened to the machine while I typed.

Zarvox is a robotic voice and not perfect by any means, but to my surprise I was impressed by how much I could understand and just how easy it was to listen to the speech. I've always regarded MacinTalk as a bit of a gimmick, and used it just for silly demos, but now I'm convinced of its worth. It would be tremendously beneficial to the partially sighted or those with reading difficulties, not to mention people like me who are just plain lazy.

I'll be using MacinTalk more from now on and encourage users to give it another go. I'd also like to hear from anyone who uses it on a day-to-day basis.

Did you know?

I got a call from a distressed friend whose Mac was refusing to start up via the internal hard disk. I suggested she try to start the machine from a floppy disk, but as it had been purchased second hand, she hadn't been given a system disk and had never bothered to make one. Things looked bleak — until she mentioned it was a Mac Classic.

Codenamed X0 and released towards the end of 1990, the Mac Classic was, and is, the only Macintosh with a built-in ROM disk. The ROM houses a minimal copy of System 6.0.3 and the machine can be booted using this by holding down the Command, Option, X and O keys on power-up. Once you boot, the Mac can be used in the normal way, as everything needed to control the system is internal.

Handy, eh? It would be good if every Mac had this facility.

Bungie jumps ahead

After all the problem solving and hard work that went in to this month's column, I decided it was time to treat myself. As luck would have it, the moment coincided with the UK launch of Bungie's long-awaited Marathon 2. After a lengthy playing session, I can reveal that it's the best game on the Mac yet.

Much more impressive than the early demo featured on the Power Computing CD from last year's MacWorld Expo in Boston, Marathon 2 sets a new standard in Mac gaming. Continuing the story about man's battle with an alien race known as the Phfor, it boasts an intruiging storyline and the best graphics and sound I've seen on a Mac title.

Bungie's new game engine is light years ahead of the competition, with smooth texture mapping in thousands of colours, realistic, ambiant 16-bit sound effects, and a variety of network options. There's also a built-in facility for adding new levels, graphics and sounds.

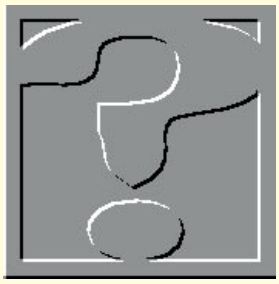
I can highly recommend Marathon 2, but you'll need at least a PowerMac to get the best from it.

PCW Contacts

Chris Cain loves to hear from Mac users. He's on **Chris__Cain@PCW.CCMAIL.COMPUSERVE COM**, **Chris@CIX.COMPULINK.CO.UK** or as **Cain@eworld.com**

Apple Computers **0181 569 1199**

Any **questions**?



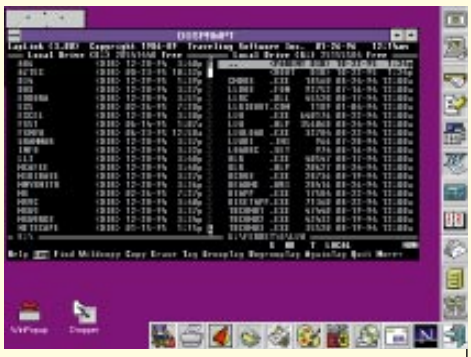
If you have a PC problem or think you could help out other readers, contact Frank Leonhardt.

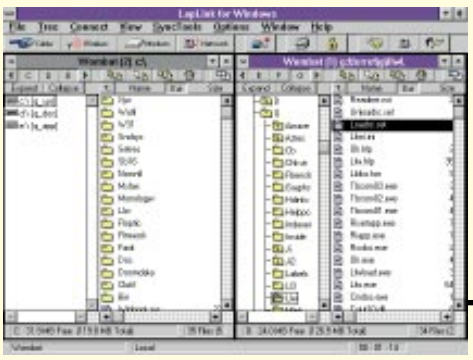
Q "I have two computers connected via LapLink V.5, a Dell 486DX66 with 16Mb RAM and a Compusys 486DX66 with 20Mb RAM. I have Windows 3.1 and DOS 6.0 on both machines and I use an old word processor, PCLite version 1.01. I use this program as it is the best I have found for doing several very specialised tasks.

I run the program from a DOS window, as I have to switch to other programs quickly. My problem is that the program works absolutely fine on the desktop computer, yet on the laptop the system crashes (totally) at a random interval of between five and 30 minutes. This crash only happens in a DOS shell — when used in DOS it works fine.

Can you suggest any causes for this crash, and any possible remedies for the problem?"

Harry Cripps <hrc@hrccons.win-uk.net>





Although you can run LapLink for DOS under Windows, the Windows version is less trouble

There is no magic explanation for this one and you'll probably never get to the bottom of it. Unfortunately, the Windows DOS-compatibility boxes, especially the Windows 3.x type, are far from perfect. Problems manifest themselves with "clever" applications such as LapLink, which have to go straight to the hardware for performance reasons.

If I had to take a guess at it, I'd say it was something to do with LapLink being unable to service the hardware quickly enough on the laptop. You may be able to get around this by selecting a simpler transfer mode. Serial transfers are most likely to work, and a low baud rate will improve your chances further still.

You might get better results if you were to tell Windows to give the DOS box exclusive use of the processor. Select Settings from the System menu of the DOS box (the one you get when you click on the top-left corner of the window) and check the Exclusive option on the resulting dialogue. This doesn't seem to work as well as might be expected, but it should help.

Running programs such as LapLink in full screen mode while they are busy is always a good idea. Writing to the text screen, rather than the graphics one, is much faster for any software. DOS programs running in a window have the additional overhead of Windows intercepting their attempts to write to the text screen and generating the necessary graphics.

Rather than getting DOS LapLink V to work, you could do a lot worse than to take a look at LapLink for Windows. In my opinion, it is one of the most useful utility programs around for anyone with more than one computer in their life. I was never a fan of LapLink V, finding it large, cumbersome and unreliable; while its predecessor, version 3, was small and efficient.

LapLink for Windows may be large by DOS standards, but it is reliable, efficient, and well-integrated within the Windows environment. It allows machines to be connected using modems and a network, as well as the cables, and includes remote control of the other machine. An interim release, version 6.0b, works with both Windows 3.1 and Windows 95. A new Windows 95 version should be available by the time you read this. Traveling Software will put the 6.0b disks in the same box for us Windows 3.11 die-hards.

Quad-speed quandary

"I'm considering purchasing a notebook computer which comes with an internal dual-speed CD-ROM drive. I'd much rather hold off if quad-speed CD-ROM drives are going to become standard issue in the not too distant future. What is the situation regarding quad-speed CD-ROM drives on notebooks?"

Sandy Henderson, Stonehaven

Quad-speed drives are definitely on the way in for notebooks. As you might have discovered, most vendors neglect to mention the speed of their CD-ROM drives unless they are actually quads; most of the time they turn out to be double or even single-speed.

Toshiba sells a quad-speed modular CD-ROM drive, for its Satellite Pro range, at a street price of less than £300. The snag is that the Satellite Pro isn't cheap. The Toshiba Tecra 700CT also has a quad-speed CD-ROM drive as standard, but you are looking at the wrong side of £4,000 for one of these.

What appears to be the same Toshiba drive turns up on the new MBC Enigma range, most of which are priced at under £2,000 if you can live without the brand name. Although I haven't seen one myself, they look good on paper.

It is only a matter of time before all the Far-East clone makers upgrade to quad-speed, but do you really need it? As I've mentioned before, the most important thing to look at is the overall performance of the system. It is true that a quad-speed drive will be able to stream data to a multimedia application faster, but does the

Frank's Bargain Basement

Where have all the modems gone?

For the best part of a year I've been recommending the GVC 1440 modem to most people seeking my opinion. It's fast, reliable and cheap.

"GVC?" I hear you ask. This is one of the biggest Far-Eastern manufacturers which turned out units for everyone else to badge and sell as their own.

Now, it seems, the supply of cheap modems from the Far East has dried up. Why? Allegedly, Rockwell, the American company which makes most of the world's standard modem chips, is now supplying local companies in favour of those abroad.

American companies now have a short-term advantage. Motorola and US Robotics make their own chips, so they aren't affected, but the rest of the world has had to put its prices up.

I say "short-term advantage" for good reason: rumours abound that groups of angry modem-makers in the Far East are planning chipsets of their own; possibly made by the likes of UMC or Cirrus Logic. Going by past form, they'll succeed and modem buyers will be the winners as competition resumes.

Rockwell can't stand still on this one for much longer without being hit by Uncle Sam's infamous "friendly fire". Good quality, cheap, modems are bound to return one way or another.

application actually need it that fast?

When it comes to database-type applications, the most important thing to watch is the access time. If you're looking up a page full of text, say 4Kk in length, then a quad-speed drive will read it in about 7ms (i.e. 1/150th of a second). A double-speed will take 14ms and a single-speed will obviously need 28ms.

Now, assuming that the application looks at half a dozen places in the CD-ROM index in order to find your information, and that each access takes 200ms (which is typical), you end up with around 95 percent of the search time being taken up with CD-ROM accesses and 5 percent being used for data transfer. Therefore, by simply doubling the transfer rate, your application will run about two percent faster. Big deal.

I can hear those word processors being fired up to write me letters insisting that quad-speed drives are much faster than that. Yes, in most cases they are. The newer quad-speed drives often have faster access times too. But don't be bamboozled by vendors waffling on about double-speed versus quad-speed, or greater. It's impressive if a drive has a 100ms access time as opposed to 600ms which was normal only a few years ago.

As far as ultra-compact notebook drives go, I wouldn't be surprised to find that many double-speed units offer faster access than the newer quads.

A hundred an inch

"I was recently told by a computer dealer that 14in monitors were being replaced by 15in because of an EC directive. The dealer was attempting to sell a monitor which cost £100 more as a result.

What is going on? Is it really worth an extra £100 per extra inch?"

Richard Allen, Worthing

It appears that at the beginning of 1996, a change in EC radiation specifications came into force. I have talked to several dealers, and they are all interpreting the rules in different ways, but they all agree that they can't go on stocking monitors which haven't been tested and found to meet the radiation emission standards. This lead to a drop in the price of old-model 14in monitors during 1995 as dealers ran down their stock, followed by a shortage of the newer units in 1996. At the moment, 14in monitors are hard to find and when you do track one down, the price has risen. As a result, dealers are offering 15in units instead.

Fifteen-inch monitors have always cost around £100 more than 14in for some unspecified reason. Whether the extra screen area is worth another 70 percent on the price tag is up to you.

PostScript print out

"I have a few (huge) PostScript files I want to print out. The problem is, I don't know how to send them to the printer from Windows.

I've tried clicking onto a .ps file in File Manager and then selecting File/Print, and I've even tried dropping them onto the print manager directly. But both times I get the 'file not associated with any program' message.

I'm on a Windows for Workgroups network with the laser printer attached to one of the PCs (the printer is PostScript compatible). I've tried from the DOS command line, too, but without luck. (I tried 'type manual.ps > prn' , 'type manual.ps > LPT1', 'print manual.ps', etc.)

What's the solution?"

Iqbal Vorajee, Lancashire

What you are attempting to do from the DOS prompt looks about right. Windows doesn't actually have an easy-to-use facility for transferring data from a file directly to a printer without attempting to format the data.

The opposite facility does exist. You can print data to a file by simply specifying FILE as the output port in the Control Panel printer setup dialogue.

There is a problem using the DOS TYPE command, however. It expects to be used on purely text files. It may well fail to copy data files correctly to a printer if they contain binary data. In particular, if it encounters the ASCII EOF character ($1A), it will consider the file to be ended at that point.

The safest method is to use the DOS COPY command instead. You can use the line "COPY /B manual.ps LPT1:" and all should be well, even if manual.ps contains binary data.

The "/B" switch forces COPY to treat the data as binary rather than ASCII text. In particular, it causes it to ignore the EOF character. By default, COPY assumes files are binary except when copying them to a device like the printer or when it is being used to join several files together.

You didn't say exactly what went wrong when you tried to print, but I would have expected you to have seen some sign of life by doing what you did.

It is possible that your printer requires the PostScript file to start with a code to tell it to switch to PostScript mode. The obvious thing to do is to look in the manual, but you may not actually have one so you'll need to resort to trickery to find out what the codes are.

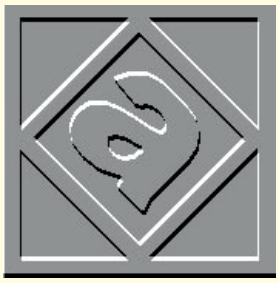
Assuming that the printer works in PostScript from within Windows, map a printer of the same type to the FILE device using the Control Panel. Print something from an application to a disk file and compare the results obtained with your existing PostScript files. You should be able to figure out what you need to add to them to make them acceptable to your printer.

PCW Contacts

Frank Leonhardt is an independent computer boffin who can sometimes be contacted on **0181 429 3047** or via email as **frank@dircon.co.uk** or **leo2@cix.clink.co.uk**. Letters may be sent to *PCW* at VNU House, 32-34 Broadwick Street, London W1A 2HG. Sorry, but due to the high volume of correspondence, individual replies are not normally possible.

Traveling Software (LapLink) **01753 818282**

MBC (laptops) **0181 208 2333**



Oiling the wheels

You needn't be a computer whizz to get the best performance from your machine. Eleanor Turton-Hill shows you the easy way to get things running smoothly and efficiently.

If you want to get the best performance from your PC, it helps to keep an eye on various aspects of your system setup. The memory in your system should be configured for the best possible results, depending on what applications you use. Also, your hard disk needs to be regularly cleaned to ensure that it is operating to best effect. I've listed here the most important maintenance tasks and configuration checks to help you keep your computer running smoothly.

You don't have to be a computer wizard to use any of the utilities mentioned here. They're all available under Windows 3.1 and DOS 6.0 (and above).

Cleaning up your hard disk

The hard disk is very important when it comes to getting the most out of your system. Most people think of the hard disk as merely a storage area for data and applications; but it is actually the most common cause of bottlenecks. Learning to maintain your hard disk is a very effective way to improve performance.

Under Windows, the hard disk is not just a passive storage area. It acts as a swap space for data, too, which Windows continually moves in and out of memory depending on system requirements. In order for this process to work efficiently, your hard disk needs to be regularly checked for the following:

1. Amount of free disk space.
2. Positive surface scan.
3. Amount of disk fragmentation.
4. Appropriate swap file type and size.

The easiest way of freeing up space on your hard disk is to regularly delete those data files or applications which are no longer needed. You can use File Manager to search for files of a certain type using "View by File Type" or the "Search" command.

Look out for graphics files in particular, as these are hungry for disk space and can easily be created and later forgotten. Take a look at the help files on your system, too — those with a .hlp extension. They can also clog up your hard disk if you're not careful. If you're reasonably confident with the applications you use, it is probably worth deleting some of these files from your system.

Next, look for temporary files. These are files with the extension ".tmp" or ".swp" and begin with a tilde (~). These must be deleted using DOS when Windows is not running. Most temporary files are stored in the TEMP directory, which is generally identified in your autoexec.bat file with the line SET TEMP = C:\temp.

Lost allocation units

The way in which files are stored on disk is complex and can easily go wrong. At the start of the disk there's a File Allocation Table, or FAT, which holds information about all the files on the hard disk.

Without the FAT, MSDOS would be unable to access the data, even though the files themselves may be in perfect condition. This is rather like a library book being filed in the wrong place: no matter how accurate the index, you will never be able to find it.

Every now and then, something goes wrong and DOS loses track of some files. This can be caused by an error in your application software, or by accidentally turning off your machine while a program is running.

Two facilities are supplied with MSDOS version 6.0 and upwards, which help you to keep up the maintenance on your hard disk. The first is "Scandisk", which recovers and removes files which have become lost. The second is "Defrag", which improves hard disk performance by defragmenting files or moving them into continuous blocks.

Scandisk can help you to recover data, or "lost allocation units", on the disk which

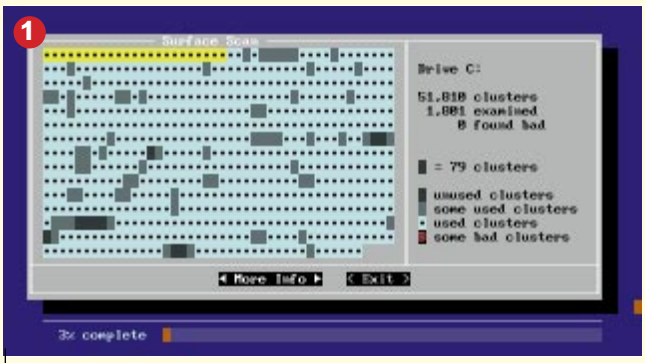


Fig 1 *Scandisk examines the hard disk surface for bad clusters*

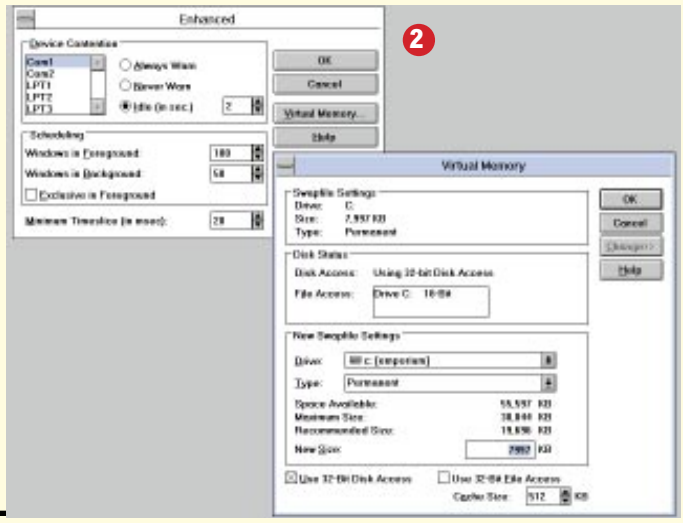


Fig 2 *The virtual memory dialogue box allows you to change your swap file settings. When they are set in place, you are forced to restart Windows*

have become disorganised. It can also check for physical faults on the magnetic surface of disks. Several different problems may be found with the way that data is organised on the hard disk. Scandisk gives you on-screen advice about the problems it detects. Just type "scandisk" at the C: prompt, and the screen shown in *Fig 1* (page ???) will appear.

Before DOS version 6.0, this kind of maintenance was carried out by a command called "chkdsk" (check disk). This is still included in DOS, but is not as sophisticated as SCANDISK when it comes to recovering data.

Virtual memory

Okay, we all know what memory is. But what on earth is virtual memory? Put simply, the virtual memory option in Windows allows you to use an area of your hard disk as if it were an extension of RAM. This is called the swap file. You only get this facility if you are running Windows in Enhanced mode.

When Windows is first installed, the setup program looks at your hard disk and recommends the best way for you to use the Virtual Memory option. If the swap file is incorrectly set up, your system performance can deteriorate dramatically. Many new users do not get round to discovering the Windows swap file until their systems inexplicably grind to a halt. The swap file facility is particularly useful if your software is very demanding and your system is short of RAM.

To check on your current swap file setup, go into the Control Panel and double click on the "386 Enhanced" icon. Then click on the "Virtual memory" button (see *Fig 2,* page ???). A dialogue box will appear, displaying the size of your current swap file, and should also tell you whether it is temporary or permanent.

Permanent and temporary swap files access your hard disk in different ways. Temporary swap files are built up from fragmented bits of spare disk space. In order for Windows to use a temporary swap file, it must pass data on to DOS each time it reads or writes.

Standard and Enhanced modes

One of the great revelations about Windows when it first appeared was its ability to run more than one application simultaneously; a phenomenon now commonly known as "multitasking". Only one application can use the processor at any given time however, so multitasking is achieved by manipulating memory in various creative ways.

This differs in the way it works depending on whether you are running Windows in Standard or Enhanced mode. You can tell which mode you're in by going to the Control Panel and checking for the "386 Enhanced" icon. If it's not there, you're in Standard mode; if it is, you're in Enhanced mode. If you've got less than 2Mb of RAM, then you must run Windows in standard mode.

Some applications also require this. In Standard mode, Windows applications are multitasking but DOS applications are single-tasking.

DOS applications run in full-screen mode and monopolise the processor, whereas multiple Windows applications can process information at the same time. This means that when you load a DOS application, all other processes must be suspended. Windows manages this by swapping the current application out of memory and writing a "swap file" to the disk. The only piece of code left behind is the Task Switcher which sits around waiting for when you want to Alt+Tab or Ctrl+Esc. When you do this, Windows is restored and the DOS program is moved to a separate application swap file.

These days, most people run Windows in Enhanced mode, allowing both DOS and Windows applications to multitask. If you've got a 286, you cannot run Windows in this mode — and it doesn't matter how much RAM you've got, either.

Enhanced mode uses the special characteristics of the 386 and 486 processors to create a "virtual machine" for each DOS application that you run from Windows. This virtual machine is effectively a simulation of an 8086 processor and inherits the memory configuration which you've got set up on your machine.

If your conventional memory is badly configured, then each virtual machine created by Windows will be badly configured too, thus duplicating performance problems each time you run another DOS application.

Permanent swap files work much more efficiently because they are made up of contiguous (that is, uninterrupted) disk space, which means that Windows "knows" the address of disk sectors and does not have to communicate via DOS.

You may find that although you have plenty of spare disk space, it is not all located in one block, and therefore, Windows will not allow you to use it as permanent virtual memory. If this is the case, you need to defragment your disk using Norton, or the defrag command in DOS 6.0 (see *Fig 3,* below). This will make your free disk space available, by putting it all into one contiguous block.

Some software, CAD in particular, recommends an optimum swap file size, but if your applications are not particularly demanding you should stick to the Windows recommended size.

Defragmenting your hard disk

Your hard disk should work perfectly well if you never use the Defrag command, but its performance will slowly deteriorate.

If you want to keep your hard disk healthy, you should use defrag about once a month. Any more, and the increased fragmentation will start to have a dramatic effect on system performance.

As a user, you would not be aware of fragmentation happening. Although the file is stored in several areas on the hard disk, it is still treated as one file. The data is still safe, but the disk drive has to make more movements to get hold of the file. This makes data access noticeably slower.

Before defragmenting your hard disk, you must first remove the swap file via the Windows Control Panel. Then simply type the command "defrag" at the C: prompt and select the full optimisation option. This should keep your hard disk in good working order and will also improve your system performance.

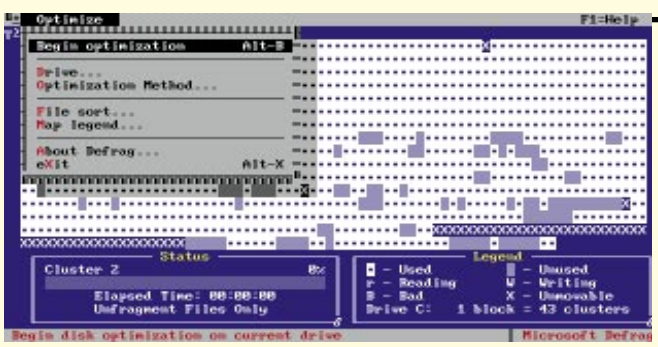
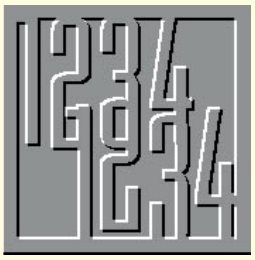


Fig 3 *The row of crosses shown here represents the Windows swap file. This should be removed before starting the defragmentation process*

PCW Contacts

Eleanor Turton-Hill welcomes any feedback and suggestions from readers. She is on **ellie@pcw.ccmail.compuserve.com**



Chiefs and **Indians**

An Indian tribal leadership election problem together with a Portuguese string comparison algorithm. Presented by **Mike Mudge**.

PROBLEM AB

Suggested by Alan Bleeze of West Sussex

The investigation begins with a fairly simple puzzle: the current chief of a tribe of 50 Indians decides who is to be chief next year by forming a circle with more than half of his tribe. He then starts counting around the circle, from the person next to him, every third person dropping out. The single Indian left at the end is the new chief. In the event, the lucky one is (surprise!) the old chief. Question: how many were there in the initial circle?

The easiest way to solve this is to work it backwards: i.e. start with a degenerate circle consisting of just the chief and add an Indian at each count of three. This gives possible answers of 2,13,20,46,157,.., only 46 lying (as required) between 26 and 51. This gives rise to the question: what series of possible answers are available for different counting values?

Alan used ANSI C to display a series up to 5000 for n = 1 to 10. Artificially inserting 1 at the start of every series... if the chief starts alone he must be the last one left. n = 1 clearly yields all positive integers. n = 2 seems to yield 2^x -1, while for example n = 8 yields

1,3,13,15,26,1276,1905,2844....

Is there an algorithm to produce the series directly without going repeatedly around the circle?

Alan has an alternative approach: evaluate the series for limit, say 50, and for n=1 to, say, 100 and display the results on a square grid. This appears to produce a recognisable pattern for which values of n the numbers 1,2,3,4 appear in the series, enabling one to predict a series for any value of n up to a limit of 4; but for numbers greater than 4 the pattern is less obvious.

PROBLEM AY

Suggested by A. Yassine of Lisbon, Portugal

System in use AMD 386DX 40MHz

Programming Languages

Turbo Pascal 6, Assembler

The Problem For the sake of simplicity, suppose that we have the following:

```
TYPE ARRAY A = 1 to 9 of 1 to 50
TYPE ARRAY B = 1 to 3 of A.
B:=((1,2,3,4,5,6,7,8,10),(1,2,3,4,
5,6,7,8,20),(1,2,3,4,5,6,7,8,50))
```

Notice that in each array elements are sorted into ascending order and furthermore there is no duplication within the array. It is required to compare the first array with the other two and to conclude that they differ by only one element. The value or position of this element in either array is not required.

The trivial approach is to compare each element of the first array with each element of each of the others. Mr. Yassine finds some drawbacks to this approach: in this simple example 162 comparisons are needed, and in his real problem the arrays are very large and such a comparison routine written in Assembler takes a prohibitively long time. He requests an algorithm that is short enough to allow comparisons between sub-arrays without the necessity of comparing each element. He asks, "Is there any mathematical process that permits the use of SUM, DIFFERENCE, SQRT, etc. as a basis for a comparison?"

Alan Cox has produced two alternative approaches which deal with the simple problem in 81 and 45 comparisons. Is this latter "best-possible"? If so, how does the figure of 45 increase with the number of sub-arrays and the dimension of each?

STOP PRESS. Alan Cox 5/1/96 Christmas Quiz by Adrian Berry, *Sunday Telegraph* 23/12/95, offered £450 for the first answer to the following: "Given that 3,5;5,7;11,13; and 17,19; are consecutive prime pairs, that is they are prime numbers separated only by two and which do not have any other primes between them. "What is the first group of FIVE consecutive prime pairs?"

Alan was initially unhappy with the double occurence of 5 in the above list and so proceeded to

9419,9421;9431,9433;9437,9439; and 9461,9463

Using UBASIC, in particular its nxtprm(n) function, Berry's problem was readily solved. However, on a 286 machine the natural extension to SIX consecutive twin primes produced no results upto about 169 million. (4×10^9 is available from UBASIC.) Alan asks for information on this sequence and "perhaps more interestingly, for an estimate of the chance of such a sequence occurring (as a function of n) making use of the known distribution of primes."

Any investigations of problems AB & AY above together with comments on n-tuples of prime pairs may be sent to Mike Mudge, 22 Gors Fach, Pwll-Trap, St. Clears, Carmarthen, Dyfed SA33 4AQ, tel 01994 231121, to arrive by 1st July 1996. All material received will be judged using suitable subjective criteria and a prize in the form of a £25 book token or equivalent overseas voucher will be awarded, by Mike Mudge, to the "best" solution arriving by the closing date.

Review of Numbers Count, September 95

"Pretty poly! and nested bubbles"

These topics produced a considerable response. Numerous responses on the nested bubbles referred to Catalan Numbers and suggested the use of J. Riordan, *An Introduction to Combinatorial Analysis* and also F. Harary, *Graph Theory*; also work by John Gilder, *Mathematics in Schools*, March 1987 and September 1987. The prize-winning entry by Jon McLoone of 10 Blenheim Office Park, Lower Road, Long Hanborough, Oxfordshire OX8 8LN, actually draws the 1842 alternatives for 10 bubbles using Mathematica version 2.2 on a Macintosh Quadra 600 in 50 seconds.

PCW Contributions welcome

Mike Mudge welcomes readers' correspondence on any subject within the areas of number theory and computational mathematics, together with suggested subject areas and/or specific problems for future Numbers Count articles.

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ORDER FORM

ORDER FORM

Personal Computer World

Use this form when you order by phone, fax or post.

ALWAYS KEEP A COPY !

SUPPLIER'S DETAILS

COMPANY .....

SALESPERSON'S NAME .....

ADDRESS .....

.....

.....

..... POSTCODE .....

DATE OF TELEPHONE ORDER ..... / ..... / ..... TIME .....

ORDER REFERENCE NUMBER (IF QUOTED) .....

DISPATCH REFERENCE NUMBER .....

CUSTOMER DETAILS

NAME .....

COMPANY .....

ADDRESS .....

.....

.....

..... POSTCODE .....

DATE OF TELEPHONE ORDER ..... / ..... / .....

ORDERED BY: ❑ TELEPHONE ❑ FAX ❑ POST

ADVERT APPEARED IN PCW:

ISSUE DATE ..... PAGE .....

QUANTITY	DETAILS OF ORDER	UNIT COST £	TOTAL £

METHOD OF PAYMENT

❑ PERSONAL CHEQUE ❑ PURCHASE ORDER ❑ CREDIT CARD

❑ C.O.D ❑ CHARGE CARD ❑ OTHER (SPECIFY) .....

CREDIT CARD COMPANY ..... START DATE ..... / ..... / .....

CHARGE CARD COMPANY ..... START DATE ..... / ..... / .....

CARD NUMBER (below) EXPIRY DATE ..... / ..... / .....

❑❑❑❑ ❑❑❑❑ ❑❑❑❑ ❑❑❑❑

SUB TOTAL	
DISCOUNT	
CARRIAGE	
SURCHARGES	
VAT	
TOTAL	

DELIVERY DETAILS

DELIVERED TO (ADDRESS)
(IF DIFFERENT FROM ABOVE) .....

.....

..... POSTCODE .....

AGREED DELIVERY DATE ..... / ..... / .....

❑ TERMS OF WARRANTY ❑ MONEY BACK

❑ RETURNS POLICY ❑ COST OF EXTENDED WARRANTY

❑ HELPLINE

Details: .....

.....

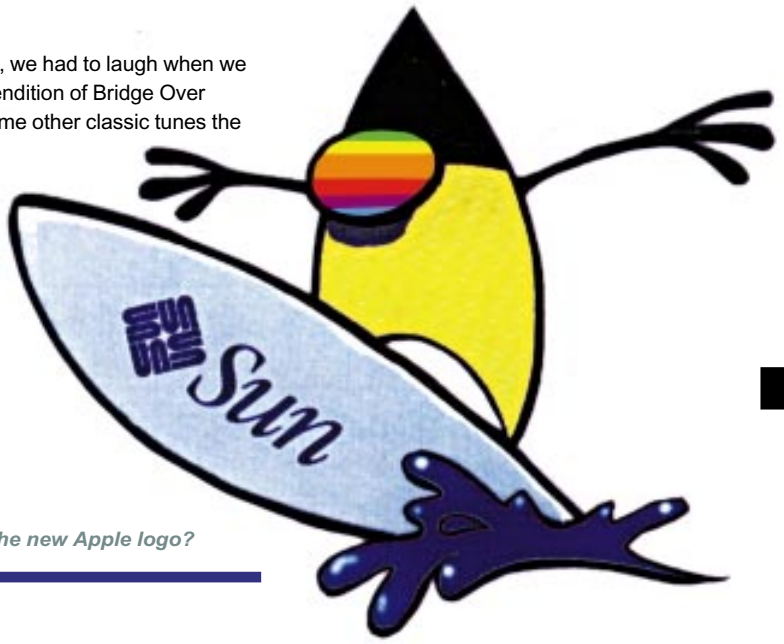
SIGNED ..... DATE ..... / ..... / ..... DAYTIME TELEPHONE NUMBER .....

ChipChat

Top Ten Tunes at Apple

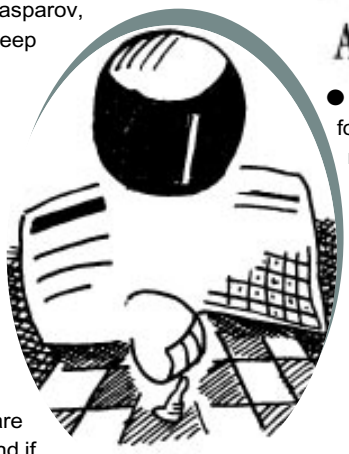
While trying to contact our friends at Apple UK, we had to laugh when we were put on hold and treated to a Casiotone rendition of Bridge Over Troubled Water. Inspired, we came up with some other classic tunes the company might like to use.

1 Things can only get better
2 Staying alive
3 Here comes the Sun
4 The Sun has got his Mac on
5 Send in the clones
6 (Tell me why) I don't like Sun-days
7 Mac the knife
8 House of the rising Sun
9 Shake, Apple and roll
10 The Windows takes it all



Could this be the new Apple logo?

World chess champion, Garry Kasparov, recently challenged Deep Blue, an IBM-built machine, to a chess match lasting five rounds. To the world's amazement, Deep Blue thrashed its human opponent in the first game using just 37 moves. Rumours that IBM has set up a subsidiary called Cyberdyne Systems are entirely unfounded (and if you're not an SF fan, Cyberdyne Systems was the company that built the terminators).



Your move, Creep

Apple Computer Acorn

● As detailed in Newsprint, page 18, Apple and Acorn are to join forces to create a new company focused entirely on the education market. Despite the wealth of technology and experience at their disposal, the partners are struggling to find a name for their new offspring. Perhaps they should go for the obvious — Fruit & Nut.

● You may remember a Newsprint article last year about a phantom email virus called Good Times, which was causing almost as much trouble as a real virus because people became scared of using email.

There is no such thing as an email virus, of course (not for common-or-garden raw text email, anyway). But we have a report from Edinburgh that a warning is still being circulated, this time by fax, against opening any email with Good Times in the subject line.

The result will not only be the trashing of your hard disk, which is a common, coarse, kind of virus thing to do. The Good Times virus apparently places your processor in "an nth-complexity infinite binary loop" which will destroy the chip if left unchecked.

You wonder about people taking it seriously. Next thing, we'll be getting a warning stating: "If you get an email with Joker in the subject line, drop your PC into a bucket of water."

Oops!

● Due to events beyond our control, some photographs on pages 114 and 115 of last month's notebooks group test were mixed up. The NEC Versa 4050H and Gateway Solo V90 photos were accidentally reversed, as were the IBM Thinkpad 760CD and Olivetti Echos P90 pictures. Our apologies for any confusion caused by the error.

● We printed the wrong contact details (last month) for the distributor of QuickView Plus for Windows 95. Readers interested in this program should call the Software Compatibility Centre on 01344 885224.

● Motorola's fax number was wrong in the February issue. The correct fax number for Motorola modems is 01293 404362.

● The "Clash of the Titans" feature we promised for this issue will run in the May issue, instead.